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An Address.[1]

By R. H. MACDONALD,

President, New South Wales Branch of the British Medical Association.

I THANK you for the honour you have paid me in electing me President of the Branch this year. I am deeply conscious of the responsibility of my office, and of the tradition of service which has been firmly established by the long line of my predecessors in the presidential chair. Now, at the beginning of my term of office, I feel somewhat awed by the task which confronts me. I derive comfort, however, from the knowledge that I may look forward with confidence to the loyal support and willing assistance of the members of your Council and the executive officers of the Branch.

The subject of my address this evening is "The Organization, Administration and Functions of the Australian Army Medical Corps from 1939 to 1945".

The Australian Army Medical Service is one of the services within the Adjutant-General's Branch. The head of the service is the Director-General of Medical Services.

The Australian Army Dental Service was a part of the Australian Army Medical Service until, in 1943, it was constituted as a separate service and from thenceforth was administered by its own director.

The medical service is responsible for the following main functions: (i) advising commanders concerning the maintenance of a high standard of health among the troops; (ii) the collection, professional care and treatment of the sick and wounded, and their evacuation; (iii) advising commanders with regard to the location of medical units; (iv) the supply and replenishment of all medical equipment. In addition, the medical service is responsible for medical examinations and medical boards, and for certain important subsidiary functions, such as the following: (i) The estimation of the hospital provision required for the army, and advice regarding the type, size and location of hospitals. (ii) The determination of medical stores and equipment required as initial equipment for medical units and for their maintenance. (iii) Arrangements through the Master-General of the Ordnance for ordnance stores and equipment for medical units. (iv) Constant research, both into methods of prevention and treatment of disease, and into the improvement of medical equipment. (v) Preparation and correlation of professional records of sick and wounded, in order that reliable statistical information may be available to assist in forward planning. (vi) Collection and evaluation of information concerning climate, endemic diseases and any other factors which may affect the health of the troops in any areas in which the army is operating, or is likely to operate in the future. (vii) Training of the personnel of the services in their technical duties in conjunction with the Director of Military Training. (viii) Recommendations concerning the appointment of medical officers of appropriate qualifications to units and staffs. The effective discharge of these and other subsidiary duties was necessary to enable the service to carry out its main functions efficiently.

The medical service is intimately concerned with all the problems of army administration and organization, and during the last war the service had considerable influence on strategy and operational planning.

[1] Read at the annual meeting of the New South Wales Branch of the British Medical Association on March 27, 1952.

An efficient medical service makes two valuable contributions to the army and thus to the nation. The first is the maintenance of the strength of the force. This is achieved in two different ways: firstly, by fulfilling one of the main functions of the service, already described—that is, by advising commanders on the maintenance of a high standard of health in their troops, and by the practice of preventive medicine; secondly, by providing early and efficient medical and surgical treatment for the sick and wounded, thus ensuring the early return of a high percentage of the casualties, as fit men, to duty. The second valuable contribution is the influence of the service in the maintenance of morale. There is no question that the knowledge that the medical service is functioning with him, and all the way down the lines of communication, is a source of great comfort to the fighting man, and is, therefore, an important factor in the morale of troops in training, and particularly in action.

While the functions of the Australian Army Medical Service are under discussion, it is interesting to note that the Australian Army was the first in the world to adopt, as a routine procedure, the X-ray examination of the chests of soldiers, on or soon after enlistment and again on their discharge.

Another innovation introduced by the Australian Army Medical Service was the practice of determining and recording the blood group of each soldier. The blood group was recorded on the soldier's identity disk and on the personal documents carried on the man.

At the outbreak of war in 1939 the staff of the Medical Directorate at Army Headquarters in Melbourne consisted of the following: (i) Permanent Military Forces officers: the Director-General of Medical Services (major-general), one Staff Officer Medical Services (quartermaster and honorary major), one Staff Officer Medical Services (quartermaster and honorary lieutenant)—a total of three permanent officers. (ii) Citizen Military Forces officers, called upon as required—maximum of sixteen days *per annum*: one Assistant Director-General of Medical Services (lieutenant-colonel), one Deputy Assistant Director of Medical Services (major), one Director of Hygiene (lieutenant-colonel), one Director of Dental Services (colonel), one Staff Officer Pharmaceutical Services (major), the Matron-in-Chief. (iii) Clerical staff (Commonwealth Public Service): a civilian clerk. Typing was carried out by typists from the Adjutant-General's pool.

On the headquarters of each Military District the Director-General of Medical Services was represented by a Deputy Director of Medical Services. Each Deputy Director had two medical officers on his staff—one a Deputy Assistant Director of Medical Services, and the other an Assistant Director or a Deputy Assistant Director of Hygiene.

The Deputy Directors of Medical Services and their medical officer staffs were officers of the Citizen Military Forces, whose duties were on a part-time basis.

There were only two medical officers in the Permanent Military Forces, the Director-General at Army Headquarters and a captain stationed at Darwin.

There were many members of the medical profession on the Active List of the Citizen Military Forces. These officers held part-time appointments ranging from those of deputy directors of medical services to those of regimental medical officers attached to units.

From this relatively small nucleus, from the Reserve of Officers, from the Retired and the Unattached Lists, and from civilian sources, it was necessary to obtain the officers required for a vast expansion of the service to enable it to deal with the enormous problems which arose with, and continued to develop, after, the outbreak of war.

During 1945, at the height of its activities, the Australian Army Medical Service employed approximately 1700 medical officers on full-time duty, and some 800 medical officers on various part-time duties.

The total strength of the service reached a peak of approximately 6000 officers (including the 1700 medical officers) and 25,000 other ranks, male and female, on full-time duty.

Australia was fortunate in that once again a considerable time elapsed between the declaration of war and the employment of her troops in active operations.

With the raising of the Second Australian Imperial Force, the necessary Australian Army Medical Corps units had to be brought into being and trained. The units which were to form a part of the first contingent of the force had to be prepared for early embarkation.

The advance party of the Second Australian Imperial Force embarked for the Middle East on December 15, 1939, and the first convoy of ships carrying the Sixteenth Brigade, Sixth Australian Division, and ancillary troops, sailed from Sydney on January 10, 1940. Included in the ancillary troops was the 2/1 Australian General Hospital, a six-hundred-bed hospital with its full complement of medical officers, Australian army nursing sisters, other officers and other ranks. In times of peace, the raising and equipping of such a unit alone, in the time available, would seem a fantastic undertaking.

Not only had the medical service to be prepared to carry out its functions with the overseas forces, but adequate arrangements were required for the Citizen Military Forces and for troops based in Australia. Arrangements were also necessary for the evacuation of certain of the sick and wounded from theatres of operations to Australia, for their medical care *en route*, for their reception, transport, care and treatment on arrival, for their final medical boarding, and for recommendations for their future employment or final disposal.

As the war developed the problems of the service were accentuated by the wide dispersal of Australian troops overseas, and by the varying conditions of the campaigns in which they served.

The medical service was called upon to cater for the needs of Australian troops stationed, or operating, in such widely separated and distant areas as the United Kingdom, Palestine, Egypt, Libya, Greece, Crete, Cyprus, Syria, Eritrea, Malaya, Java, Ceylon, New Britain, Papua, New Guinea, the Solomon Islands, Timor, Dutch New Guinea, Morotai and Borneo, as well as in the six Australian States and the Northern Territory. Many of these commitments were coexistent, and geographical considerations alone constituted a major problem.

Shortly after war was declared the organization of the medical directorate into sections was begun. The organization was based on that of the medical directorate at the War Office. The strength of the directorate at its peak numbered some 60 officers, 50 other ranks and civilian clerical personnel. At the end of the war the directorate was organized with nine sections. Duties were allocated as follows:

The Director-General of Medical Services and the Deputy Director-General of Medical Services were responsible for general direction and supervision of medical policy, and visits of inspection to theatres of operations and lines of communication areas.

A.M.D.1, administered by an assistant director-general, was responsible for the administration of Australian Army Medical Corps officer personnel. This section was responsible for recommendations for first appointments, promotions and posting of officers.

A.M.D.2, administered by an assistant director-general, was responsible for hospital accommodation, medical standards for recruits, medical board procedure, medical transport, including ambulance trains, ambulance aircraft and hospital ships, invaliding, medical rehabilitation and associated matters.

A.M.D.3, administered by an assistant director-general, was responsible for the provision of medical equipment and stores, scales of issue of medical stores, patterns of medical equipment, maintenance of medical stores *et cetera*.

A.M.D.4, administered by the Matron-in-Chief, was responsible for the administration of the Australian Army Nursing Service.

A.M.D.5, administered by the Director of Hygiene, Pathology, Entomology and Parasitology, was responsible for advice on these subjects, the collection of information on the incidence of disease, water supplies, climatic conditions and environmental aspects of different territories and localities, the preparation of statistics of diseases within the

army, advice on measures to control the spread of disease, advice on immunization policy, advice on measures to control wastage from the effect of insects and parasites, maintenance of the scientific library of the directorate, and assistance to the Director of Medicine in experiments in methods of prevention and treatment of disease.

A.M.D.6, administered by an assistant director-general, a non-medical officer of the Permanent Military Forces, was responsible for organization, administration, coordination and general duties.

A.M.D.7, administered by the Director of Medicine, was responsible for advice on medical policy and medical treatment, for consultant duties, technical instructions and assistance in the selection of physicians for specialist appointments. The Director of Medicine was chairman of the combined "Advisory Committee on Tropical Diseases", which was established at General Headquarters, South-West Pacific Area, from its inception until its abolition in the late stages of the war in the Pacific. The activities of the Medical Research Unit, which was established at Cairns, were supervised by the Director of Medicine.

A.M.D.8, administered by the Director of Surgery, was responsible for advice on surgical policy, supervision of surgical work in the service, surgical training, the preparation of technical instructions, consultant duties and assistance in the selection of surgeons for postings to specialist appointments. The Director of Surgery also supervised the duties of the Advisors in Venereology, Ophthalmology and Radiology and the Chief Physiotherapist.

A.M.D.9 was responsible for the administration of the Australian Army Medical Women's Service and was administered by the Controller of that service.

Assistant directors-general of medical services were appointed to the Australian Army Staff, London, and to the Australian Military Mission, Washington. These two officers maintained valuable liaison with service medical authorities in their respective spheres and provided service channels for the exchange of technical information.

The Director-General of Medical Services was chairman of the Central Medical Coordination Committee, which was appointed when mobilization of the Australian Military Forces was ordered and the compulsory provisions of the *Defence Act* and National Security Regulations came into operation. This committee was charged with the function of regulating the distribution of medical manpower between the three services and the civil community.

The Medical Equipment Control Committee was a subsidiary of the Central Medical Coordination Committee, and with this committee the medical equipment section of the medical directorate (A.M.D.3) maintained the closest liaison.

The Director-General of Medical Services (Army) was also chairman of the committee of services medical directors. This committee consisted of the heads of the medical services of the Royal Australian Navy, Australian Army and Royal Australian Air Force.

The Director-General of the service was represented at headquarters of the Australian Imperial Force (Middle East) by a director of medical services; at Advanced Headquarters by a deputy director-general; at headquarters of First and Second Armies by directors of medical services; at headquarters of each corps by a deputy director; at headquarters of each division by an assistant director; at headquarters of Northern Territory Force by a deputy director; at headquarters of each lines of communication area by a deputy director (except in Tasmania, where the representative was an assistant director); at various base sub-areas by an assistant director or a deputy assistant director of medical services. Each director, deputy director and assistant director was supplied with a staff of assistants and advisers appropriate to his appointment.

The distribution of technical and specialist advisers on headquarters of formations *et cetera* was arranged to provide a complete organization throughout the forces, with appropriate channels for dissemination of information and advice, and to provide for the necessary control.

The list of units raised during the war is an imposing one and included: 39 general hospitals, varying in capacity from 200 to 2000 beds; six special hospitals; three women's hospitals; one orthopædic hospital; 90 camp hospitals, varying in capacity from 30 to 210 beds; four hospital ships (including the *Oranje*); 15 ambulance trains; 17 convalescent depots for men, varying in capacity from 250 to 2000 men; one convalescent depot for women; two outpatient depots; five blood and serum preparation units; four facio-maxillary and plastic surgery units; one blood transfusion unit; 36 hospital laundry units (types "A" and "B"); two optical units; three Australian Army Medical Women's Services barracks; one nurses' rest room; one Australian Army Medical Corps school; two Australian Army Medical Corps training battalions; one Australian Army Medical Corps training company; one school of malaria control; one school of hygiene and sanitation; one Australian Army Medical Women's Service nursing training school; two Australian Army Medical Women's Services training companies; one medical research unit; one mobile operating unit; seven mobile bacteriological laboratories; four mobile microradiographic units; 10 motor ambulance convoys (these later became Army Service Corps units); eight mobile entomological sections; 12 mobile bath units; three sea ambulance medical staffs and three sea ambulance transport companies, for staffing troop transports; one army headquarters medical store; six lines of communication area medical stores; two base depots of medical stores and 12 advanced depots of medical stores, with field formations; one water ambulance convoy; 32 malaria control units (types "A", "B" and "C"); two Australian Army Medical Corps beach group companies for amphibious operations; 14 casualty clearing stations; nine light field ambulances; 35 field ambulances.

In addition to the postings required to staff the medical units and for appointments to the various headquarters, medical officers were posted as regimental medical officers to all infantry battalions and corresponding combatant units on the war establishment of which a regimental medical establishment was provided.

Hospitals.

At the outbreak of war in 1939 the army had no hospital facilities. During the early period soldiers requiring hospital treatment beyond the scope of camp facilities were admitted to repatriation or civil hospitals. Camp hospitals were first erected in the Australian Imperial Force camps, and these were able to deal with minor cases. As the number of men undergoing training increased, it became necessary for the army to make its own arrangements for treatment of the more serious cases of illness and to prepare to receive the invalids returning to Australia from the overseas forces.

Construction was begun of military (base) hospitals in or near the capital cities. These military hospitals ultimately provided beds on the following scale, in multistoried buildings and pavilion wards: Brisbane, 612 beds; Sydney, 1675 beds; Melbourne, 2000 beds; Adelaide, 492 beds; Perth, 723 beds. A hutted general hospital was established at Campbelltown in Tasmania.

Special war establishments, war equipment tables and scales of equipment were required for these units, which were staffed by part-time visiting officers in addition to the medical officers carried on the respective war establishments.

The planning and equipment of these hospitals and the administrative work involved in their establishment during the war constituted a colossal undertaking.

General hospitals of 1200, 600 and 200 bed capacities were raised and allotted to overseas formations of the Australian Imperial Force according to the recommendations of the Director-General of Medical Services. Later, Citizen Military Forces general hospitals were raised, equipped and sited as these forces were called up for duty.

The movement of major formations from one State or locality to another, and other factors, involved considerable adjustment of hospital provision and movement of hospital units. A considerable number of camp hospitals was raised. Camp hospitals were built up in 30 bed units to a maximum of 210 beds. Generally the equipment of camp hospitals was limited, but in certain instances

theatre equipment was provided and a surgeon was carried on the establishment. In general, the function of a camp hospital was to provide in its area in-patient treatment for soldiers whose stay in hospital was expected to be of short duration and whose treatment was simple. The evacuation of such patients was thus avoided.

The general hospitals with overseas forces, with few exceptions, were of 600 or 1200 bed capacity. It was sometimes necessary for a 600 bed hospital to increase its establishment by increments of officers, nursing sisters, other ranks and equipment to that of a 1200 bed hospital. The 1200 bed units, by similar increments, could be expanded to accommodate 2000 patients. Provision was made for expansion of both types by multiples of 100 beds.

Such formal expansion required a little time; consequently, in times of stress, the general hospitals were required to accommodate, treat and care for sick and wounded in numbers far in excess of their authorized establishments.

General hospitals furnished surgical teams, which, during active operations, went forward to casualty clearing stations or to main dressing stations, and even to advanced dressing stations of divisional field ambulances.

According to modern civilian standards, the war establishments of general hospitals in medical officers and nurses was on an economical basis. The war establishment of a 600 bed general hospital provided for 17 (later 16) medical officers and 75 trained nurses, and that of a 1200 bed hospital provided for 29 medical officers and 120 nurses.

In addition to the trained nurses, who were members of the Australian Army Nursing Service, the war establishment of the general hospitals provided for male nursing orderlies of the Australian Army Medical Corps.

General hospitals are large units with much equipment and many heavy stores. The movement of such a unit is a major undertaking, and when a general hospital is moved to a new site in the field, a considerable amount of work is necessary before the unit can function. Much work is required of the Royal Australian Engineers, such as the provision of a water supply, erection of huts, construction of roads of access, internal roads and hard standings for vehicles *et cetera*. Much work is also required of the unit in unpacking bulky and heavy ordnance and medical stores, erecting tentage and equipping wards, operating theatres, kitchens *et cetera*.

In spite of the difficulties involved, it was necessary, in the South-West Pacific Area, to move general hospitals frequently to provide for the needs of the advancing troops. The sites and facilities available were not always ideal, but under operational conditions the general hospitals employed overseas attained in all cases an amazing capacity for mobility and early establishment in new sites.

It is perhaps difficult for some of us who are accustomed to work in civilian hospitals equipped with reticulated steam, electric mains and sewerage and with modern facilities for garbage disposal, cooking, refrigeration and laundries, to imagine the problems which were met with and overcome by large general hospitals in the field, operating under canvas and in huttage accommodation, in trying climatic conditions, when large convoys of sick and wounded arrived for admission.

The fact that the difficulties were overcome and that the field general hospitals were able to provide a very high standard of treatment and comfort for the casualties must have proved a source of satisfaction and pride to the personnel of these units.

The percentage of hospital beds to troops varied at different times during the war. The approximate average provision of beds in camp, general, special and military (base) hospitals was some 8% of the total strength of troops. A peak provision of 35,000 authorized hospital beds was reached at one stage.

This stage of development was a major achievement by a service which, it will be remembered, commanded no hospital facilities whatsoever at the beginning of the war.

Casualty Clearing Stations.

Casualty clearing stations are army troop units and are normally mobilized on the scale of one per division.

The normal capacity of a casualty clearing station is 200 patients, 50 of whom are accommodated in beds and 150 on stretchers.

Although the normal capacity is 200 patients, casualty clearing stations had always to be prepared to deal with much larger numbers.

A casualty clearing station is the first medical unit on the line of evacuation in which some hospital bed accommodation and nursing by trained nursing sisters are available. Its normal function is to receive sick and wounded from the main dressing stations of field ambulances and from troops in the area. Casualty clearing stations normally evacuate to general hospitals on the lines of communication.

The war establishment from 1943 to 1946 provided for fourteen officers (including three chaplains), eight Army Nursing Service sisters and 94 other ranks. On the tropical scale the number of other ranks was increased to 113.

Surgical teams were often added from general hospitals.

A casualty clearing station is subdivided into a heavy and a light section. The light section is comparatively easy to transport. Casualty clearing stations are not equipped with transport capable of moving the unit.

In 1943 a plan for transporting a casualty clearing station in 25 C-47 aircraft was drawn up and subsequently carried out with success.

These units carried out a very useful function. They were more easily moved than 200 bed general hospitals and the war establishment provided for an adequate number of medical officers for their normal role.

A high standard of surgical and medical treatment was available in casualty clearing stations. On occasions in New Guinea, casualty clearing stations were called upon to carry out roles for which they were not designed, and some of these units have held and treated over 1000 patients in times of emergency and stress. Medical planning was concerned with the avoidance of such overloading of units.

In the Borneo campaign a casualty clearing station was allotted to each division, and, in addition, two casualty clearing stations were included in corps troops.

Field Ambulances.

Field ambulance units were normally mobilized on a basis of three per division as divisional troops and one per corps as corps troops. In the Borneo campaign the number of corps field ambulances was increased from one to three.

A field ambulance was designed to provide accommodation for 150 patients, but its capacity was not limited to this number.

The unit consisted of a headquarters and two companies. The headquarters was capable of forming a main dressing station, and each company was capable of forming an advanced dressing station.

The function of an advanced dressing station was to collect casualties from regimental aid posts, to provide them with shelter and treatment, and to arrange their evacuation to the main dressing station.

Normally the regimental aid posts are cleared by field ambulance stretcher bearers.

From the advanced dressing stations the casualties were normally evacuated to the main dressing station by motor ambulance vehicles of the field ambulance. The advanced dressing station is the most advanced post where those wounded in action are normally taken over by the medical service.

The war establishment of a field ambulance provided for 12 officers and 226 other ranks in 1940. Minor modifications were made from time to time, and two medical officers were replaced by two bearer officers (lieutenants, non-medical) in 1942. A tropical scale was later introduced which reduced the number of motor transport drivers, because of the reduced scale of vehicles, but

increased the number of stretcher bearers and orderlies. The present war establishment provides for eight medical officers.

Field ambulances proved themselves to be amazingly versatile and efficient units. In addition to carrying out their normal roles, they adapted themselves to a very great variety of employment. At different times these units were called upon to function in small independent sections, and to adapt themselves to reinforcement by companies from other field ambulances or to strengthening by the attachment of surgical teams, a mobile bacteriological laboratory, or even the light section of a casualty clearing station. They were also called upon to supply sections to act as regimental aid posts and medical posts on beaches and aerodromes in connexion with evacuation of casualties by sea or air; to provide medical staging posts along the line of evacuation in the "track" campaigns; to act as rest stations, convalescent depots, small general hospitals and special hospitals; and even to supply a medical service for civilian native personnel.

These and other tasks were carried out efficiently and well by many of the field ambulances.

Regimental Medical Officers.

The regimental medical officer attached to a combatant unit is the most forward representative of the Army Medical Corps, and in his important and responsible position provides the link between the fighting man and the medical service. He is in medical charge of the unit to which he is attached, and apart from action, his duties are many and varied. During action he establishes the regimental aid post. The unit stretcher bearers are placed under his command. He provides shelter, comfort and first aid for the casualties, initiates their medical records, and prepares them for evacuation to the field ambulance responsible for clearing his post. The chaplain attached to the unit is his right-hand man.

I was fortunate to have the opportunity of serving as a regimental medical officer to an infantry battalion in the first desert campaign. Living with and serving with such a unit gave me the chance to study the Australian soldier at close quarters, and I have held him in very high and affectionate regard ever since.

Although conditions did not always permit a high standard of physical comfort, and although during actions the furnishings, facilities and conveniences of my regimental aid posts compared very poorly with those of a suite of rooms in this building, I shall always look back on this part of my service as one of the times of richest and most satisfying experience in my career. In this appointment I learnt from the Assistant Director of Medical Services of the Division, from his deputy, and from the commanding officers of the divisional field ambulances, the principle of "looking after the man in front". I hope that in my later appointments I never forgot that principle.

Neither the time available, nor the scope of an address such as this, permits even a brief description of many important aspects of the work and services rendered by the Australian Army Medical Corps in the last war. Passing reference only may be made to a few of these.

The fascinating story of the pre-war planning by the Director-General of Medical Services and his staff on the equipment side, and the influence this planning had on the transition of the corps from a peace-time to a war-time footing, must be told elsewhere.

The full story of the magnificent work of the medical service in Malaya is still to be told.

The adoption by commanders of the advice of the Director-General of Medical Services on precautions and protective measures against tropical diseases was followed by dramatic results. No other single factor contributed so largely to the success of our arms in the Pacific. One example only may be briefly mentioned. Milne Bay was known to be an extremely high endemic malarious area. It was recognized by the service that the medical hazard to a force operating in the area would be great and that a calamity could be avoided only by insistence upon rigid antimalarial measures. Comprehensive instructions were issued accordingly, and the medical service ensured the assembly of an adequate supply of antimalarial stores and equipment ready for shipment with the embarking force. In spite of urgent representations by the Director-General of Medical Services, the stores were left at Townsville, owing to an extreme shortage of shipping space. Malarial discipline in the force was poor; consequently malarial casualties were very heavy. The most energetic measures were instituted by the Commander-in-Chief when the gravity of the position was explained to him by the medical service. As a result, the malarial rate fell from a peak of 82 cases per thousand per week to 25 cases per thousand per week in a fortnight, to 10 cases per thousand per week in a further three weeks, and, finally, to a practically negligible rate of one or two per thousand per week.

The culmination of the efforts of the Director-General of Medical Services, the Director of Medicine and the Director of Hygiene in the task of convincing commanders of the vital importance of prevention of disease was a conference held at Atherton in June, 1944, the proceedings of which make very interesting and informative reading.

The importance of this aspect of the work of the service cannot be exaggerated, and the efforts of the Director of Medicine and of the Director of Hygiene and his representatives with formations in the field were very largely responsible for averting medical disaster in the campaigns of the Australian Military Forces in the Pacific Islands.

The medical directorate and the chairman of the Medical Equipment Control Committee were closely associated with the commencement of the production of penicillin in Australia. On representations by the Director-General of Medical Services, the visit was authorized of two army officers to America to investigate methods of manufacture. The Minister for Health agreed that the Commonwealth Serum Laboratories should undertake production as a measure of first priority. The officers left for America in October, 1943, and returned in December, 1943, and within an amazingly short time, penicillin was being produced in large amounts by the Commonwealth Serum Laboratories.

Time will not permit even the briefest description of the work of the Australian Red Cross Society and of its assistance to the Army Medical Service; of the organization involved in providing blood and serum for casualties in forward areas; of the modifications made in handcarriage and transport of casualties by land, sea and air in the difficult areas in the islands; of the modifications required in packing medical stores and equipment; of air supply to forward units; of the work of the Army Medical Corps beach group companies; of the hospital ships; of the work of the Australian Army Nursing Service and the Australian Army Medical Women's Service; and of many other interesting and important facets of the service.

Within the confines of this address I have endeavoured to show—particularly to our younger members—what an enormous undertaking the Australian Army Medical Corps discharged during the last war. The work was done and well done. The results were not achieved without sacrifice.

Eighty-two medical officers of the three services, including thirty-five from this State, were killed in, or died as a result of, service in the 1939-1945 war.

A further unassessable sacrifice in health and in years of expectation of life was made by medical officers of the services and by their colleagues who accepted additional burdens of heavy work and long hours in providing a medical service to the civil community during the war years.

In thinking of those of our members who gave their lives in the service, I quote the exhortation inscribed on the Haileybury War Memorial in England:

> Ye who come after them, forget not their sacrifice; claim as your heritage a portion of their spirit, and in peace or in war take up their sword of service, so shall the living and the dead be for all time bound in one fellowship.

I suggest that if the Royal Australian Army Medical Corps be called upon, once more, to provide a service in war, notice may be short, and time available in which to prepare may be limited.

To make a success of the service required of the corps in times of national emergency, it is necessary to have certain basic requirements prepared in advance. Not the least of these is the solid steel framework of a sufficiency of thoroughly trained, efficient and experienced officers. Onto this framework the structure of a complete service might well be built in emergency. A knowledge of army organization and administration and at least some military training are distinct advantages and assets to the officers destined to represent the bricks and mortar of the completed structure in time of war.

It is therefore my fervent hope that the younger members of the profession will continue to seek the training available for medical officers in the Citizen Military Forces, and that the establishments of the Royal Australian Army Medical Corps of the Australian Regular Army will be filled at home and abroad, in peace and in war.

Acknowledgements.

I am indebted to Major-General F. K. Norris, C.B.E., D.S.O., E.D., K.H.P., Director-General of Medical Services, for his encouragement in the preparation of this address, and for supplying me with a copy of the Army Headquarters medical directorate history. From this history I have extracted much of the information laid before you this evening.

BLOOD GENETICS OF VARIOUS POPULATIONS IN BORNEO.

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IN recent years an endeavour has been made to amass serological data for Pacific races which, it is hoped, will prove of value in helping to identify racial components that, mixed in various proportions, have been responsible for observed differences in the physical anthropology of populations of the Pacific. Simmons and Graydon (1951) have summarized in tabular form their results up to early in 1950 for the A B O, M–N and Rh blood group systems of a number of Pacific populations. Since that paper was prepared the results of investigations on Chinese (Simmons, Graydon, Semple and Green, 1950) on Maoris (Simmons, Graydon, Semple and Taylor, 1951) and Marshallese (Simmons, Graydon and Semple, 1951) have been reported. Other papers to be published in the near future will deal with the Ainus of Japan, the Negritos of the Nassau Mountains of Dutch New Guinea, several groups in the Central Highlands of New Guinea, the Bainings of New Britain, the Australian aborigines and several groups in the Caroline Islands.

Although a serological survey of the native peoples of Borneo seemed to promise critical information of gene frequencies, no blood grouping data for any ethnic group on that island have been published as far as we are aware. Consequently, opportunity was taken as it occurred over a period of about two years to collect blood samples in different parts of Borneo for comprehensive tests under laboratory conditions in Melbourne. Similar arrangements had proved successful in previous investigations.

To permit sound interpretation of the results, we thought that up-to-date comments on the tribal groups examined should be obtained, if possible, from an ethnologist who had studied these peoples at first hand. We were fortunate indeed in obtaining the collaboration of Mr. Tom Harrisson, who had made extensive studies in Borneo recently. The ethnological notes which follow are entirely his.

The material studied in this paper consists of blood samples from 584 inhabitants of Sarawak and Brunei (West Borneo) obtained in 1948-1949, and saliva samples from some of the same subjects. These were distributed among five broad groups of people, as follows: (*a*) in Brunei: (i) 50 Bruneis, (ii) 178 Kedayans; (*b*) in Sarawak: (iii) 176 Melanaus, (iv) 97 Land Dayaks, (v) 83 Sea Dayaks (Ibans).

The Bruneis may be further classified as "Malays"; the Kedayans are intermediate between Malay and "Dayak", but with a majority of Malay associations. The Melanaus are balanced towards the Dayak, but "become Malay" by a process to be described. The Land Dayaks and Sea Dayaks are directly Dayak, as their names suggest.

To understand the relationship between these ethnic groups it is necessary to examine the structure of Borneo's main human population as a whole, particularly since nearly all the Dayak section of the population of West Borneo migrated from East Borneo, starting many centuries ago and continuing to historic times.

We shall therefore consider the relationship between the three main groupings, then briefly estimate the possible significance of other influences not directly implicated in these three known modern groups, and finally discuss the relevant special characteristics of the five smaller groups which constitute the present sample. It is hoped that this will allow a valid appraisal of the results and facilitate comparisons with further work in Borneo—the need for which is evident from the results of the present first study.

MAIN GROUPS.

The present population of Borneo may be broadly divided into three main groups: (i) "Dayak", (ii) "Malay", (iii) Chinese. These have their roots far back into Borneo history and pre-history, even though most of the Chinese derived from migrations during this century, and the Malays as a whole have been described as such only in the last five hundred years. But many of the Dayaks, notably the "Sea Dayaks" (Ibans), are relatively newcomers too, when compared with ancient units such as the Sekapangs of the upper Rejang or the Serus—now reduced to two persons living near Saratok in Sarawak. All three groups overlap, intermix and relate in varying, complex and often uncertain degrees. All are relevant to the present study, especially because this study centres on Brunei and Sarawak, in west Borneo, a classic centre of early Chinese contact, and later of Malay power and massive Dayak immigration. In Sarawak and Brunei, the 1947 census (Noakes, 1949) totals were as follows: Dayak 313,000, Malay 114,000, Chinese 153,000. All other Asiatics, Europeans *et cetera* totalled only 7000, or less than 1%.

"Dayak."

The term "Dayak" (which really means only "inland chap", from the root *daya* or *aya*) is used in varying connotations in different parts of Borneo; but there is no other over-all term. It is generally taken to cover all those peoples who live inland from just behind the coast, like the Sebayaus, to weeks away in the interior uplands, like the Kelabits. Despite wide differences in language and custom, these Dayak peoples have much in common—such as the long-house, general appearance and tattooing. No exact definition is at present possible, and there are many gaps in anthropological knowledge. Even the common factor of pagan animism, valid until recently, is now inadequate, owing to a great movement towards Christianity (of five denominations) since the end of the Japanese occupation. Moreover, many of the Malay group of today were Dayaks of yesterday. The pagan who moves to or lives near the coast is likely to come under pressure of a literate and more sophisticated culture, Mohammedanism. In general, a converted Mohammedan in Borneo is forthwith classed as a "Malay".

There are also groups of Dayaks who have come under heavy influence from the coast without actually turning to Islam. The most conspicuous of these are the "Land

Dayaks" of south-west Borneo. While retaining their "Land Dayak" (Bidayuh *et cetera*) character and culture, they have been much affected first by Hinduism then by Mohammedanism; also, owing to the presence of gold in several parts of their area, they have in the past intermixed physically with the Chinese (who seldom had sufficient women in the early gold days).

The Land Dayaks are an example of a people who are partly "old" in west Borneo, but have continued to migrate for many generations up to recent times.

The Sea Dayaks (Ibans), who live north and west of the Land Dayaks, are later arrivals in the western half of the island and have perhaps the strongest solidarity of any group at the present day. They are the most numerous, as also the most Christianized. A large proportion of the once dread "headhunters of Borneo" now wear short hair and short trousers instead of flowing tresses and marvellously tattoed throats.

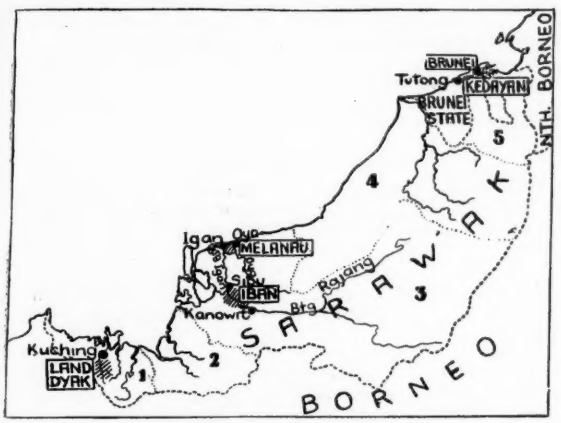

FIGURE I.
Areas from which blood samples were collected are indicated by shading.

"Malay."

The Malay group is largely composed of absorbed Dayaks, as has been noted above. There were almost certainly no indigenous Malays when Mohammedanism was brought to Brunei in the fifteenth century, developing under influence from Malaya and directly from Arabia through often fanatical Arabian teachers. The first Sultan of Brunei was almost certainly a converted Dayak, probably a Murut. Paganism still plays a major part in Mohammedan rites in west Borneo today (Harrisson, 1950). On the other hand, much of the Brunei royal regalia and coronation ritual is conspicuously Chinese.

Islam's new power and simple message, so much easier to live with and enjoy than the vast network of fears and restrictions, rules, obligations and penalties in Dayak animism, dominated the coast. The far inland people were little affected. Even when the Sultanate of Brunei was at its peak in the sixteenth century and "ruled" all Borneo, it had little or no control over the inlanders.

The Melanaus of the Sarawak coast are the outstanding example of people absorbed into Mohammedanism in historic times, a process which continues. In the same districts and even villages pagan ("Liko") and Mohammedan ("Melayu") Melanaus live side by side. Both are included in our sampling. A Mohammedan, like a Roman Catholic, demands that outsiders marry into the faith. The Melanaus, as they are today, represent very much the sort of transition pattern into "Malayism" which occurred in the earliest Brunei Mohammedan times, five hundred years ago. In origin they are thus partly a coastal people, but are also an "old" inland people.

Thus, to sum up, the Malays of west Borneo are clearly in origin a composite group, though in recent centuries Bruneis (that is, those Malays in the State of Brunei) have felt so strong in social position and prestige that they have less often intermarried in the way in which the Sarawak Malays continue to intermarry with Melanaus, Segalangs *et cetera*.

Several interesting interstitial groups exist. These are partly Mohammedan (for example, the Bisayas) or wholly so, like the Kedayans, who live mainly in Brunei but retain a strong identity.

Chinese.

The Chinese have not been directly included in this study. Indirectly they impinge very appreciably upon it, firstly by their admixture with the Land Dayaks (this admixture is mainly a century or more old—Harrisson, 1949—but it still continues to a small extent), and secondly, by their great cultural influence throughout the area. The original crown of Brunei and the royal cat of gold which are Ming (A.D. 1368-1643) insignia are not the only evidence of this influence. The most valued material objects in the life of Sea Dayaks near the coast and Kelabits in the far uplands are old Chinese jars, while the Melanaus specialize in Sung (A.D. 960-1279) and Ming celadon plates and pots.

Of the five groups included in this study, the Land Dayaks are most likely to have been directly affected by Chinese blood. The Bruneis, too, have a well-established Chinese link, agreed in all versions of the Brunei *silah silah* manuscripts, though details vary. Certainly the second Sultan married a Chinese of high birth, and their daughter married the third Sultan, an Arab and descendant of the prophet. It is likely that the Sultan's example was followed by many of his citizens and that there was a considerable Chinese settlement in Brunei during the Ming dynasty. It is also more than likely that Chinese established trading settlements (perhaps seasonal) at points along the coast in the present Melanau country then and earlier, and that these mixed with the local females. Something more than casual visits or second-hand trade were required to produce the mass of early Chinese ceramics all through this area, not only pieces in existence today, but pieces in the ground —including a vast dump at Santubong, an old Melanau settlement in the south-west (excavated 1950-1951), and even far upland megalithic tombs (Harrisson, in the press, *a*).

It is probable that Chinese influences on west Borneo antedate the Sultanate of Brunei very considerably. One important indication of this is the presence of T'ang (A.D. 618-906) type pottery, even among the Kelabits of the far interior. But these are "export wares", difficult to date with certainty, since one type was made over a long period. There are also many references to Poli and related names in Chinese annals as far back as the fifth century. But again much controversy has centred on whether or not this is Brunei. (For a summary of arguments pro and con, coming down considerably pro-Brunei, the reader is referred to the series of papers concluded by Sir Roland Braddell, 1951.)

OTHER INFLUENCES.

As regards physiology, the Dayak, Malay and Chinese factors are unmistakable in importance over west Borneo as a whole, in that decreasing order of impact. Other factors of varying importance, though no longer manifestly significant in the twentieth century, must now be briefly considered. They can be broadly classified, for present purposes, into the following: (i) palæolithic and mesolithic; (ii) neolithic; (iii) Negrito; (iv) "Asian" mainland; (v) "Indonesian".

Palæolithic and Mesolithic Factors.

Although remains of early men have been extensively found to the south of Borneo in Java, and palæolithic implements have been found abundantly there and north in the Philippines, neither early bones nor tools have so far been discovered in Borneo (Beyer, 1948). Of the later so-called "mesolithic", the indications are also notably thin and unproven.

It is difficult to believe there were no early men in Borneo, but it does look as if they were very scarce there.

Neolithic Factors.

The neolithic age, the later stage of the "stone age", is abundantly represented by implements, including types not known elsewhere.

There are strong indications, however, that the stone age continued up to quite recent times (Collings, 1950; Harrisson, 1951), and that the persons mainly concerned in it were the earlier sections of the Dayaks, such as Sekapangs and Serus, to which reference has already been made.

Negrito Influences.

Despite the evidence for Negritos in adjacent countries, there is none for Borneo so far.

There seem to be indications that, for reasons not yet clear, Borneo was largely missed on some of the early migrations through the north-west Pacific. It may be, though, that these gaps in our knowledge are only an index of the acute backwardness of archæological research in Borneo. Yet even now Borneo, which is by far the largest island in this area, is much the least populated, and large areas of the fertile interior are wholly uninhabited.

"Asian" Mainland Influences.

Anthropological literature teems with speculations on migration routes from the mainland of Asia into the islands to the south-east (compare Heine-Geldern, 1947). The "Encyclopædia Britannica" (1947) summarizes the theories of Caucasian and Indonesian types migrating via India, Burma, the Philippines *et cetera*; but much of this material is tendentious. There are striking affinities between customs, beads and beliefs among some of the inland Dayaks and the Nagas of Assam and other mainlanders. Such migrations undoubtedly did occur. But what is far from clear is the extent to which they were definite, defined and one-directional at any one time in Borneo. Evidence is accumulating that the pattern of human movement here was multiple and complex, to and fro, clash and recoil. Here again Borneo seems to have lain on a somewhat neglected crossway.

We may expect that strangers from many directions reached Borneo, but that the strongest moves were those via Sumatra and Java into south-east Borneo, then overland to the west side of the great spinal range.

"Indonesian" Influences.

The term "Indonesian" is used in a more local sense than that sometimes employed by ethnologists; it refers here to the non-Dayak peoples of the surrounding islands, most of whom are now Mohammedans.

These islands have impacted conspicuously on the Malay group, by providing Malays not only to mix with the previous coastal population, but also to provide discrete communities, the most conspicuous being the Bugis from the Gulf of Boni in the Celebes. There are large settlements of Bugis in Sarawak, retaining their independent Bugis outlook.

This impact is conspicuous, but quantitatively slight. Far less conspicuous, but much more important, is the impact on the Dayaks.

There is no doubt that the major part of the present Dayak population in west Borneo is descended from people who moved from or through Java and Sumatra especially. There are many specific references to these islands in the folk-lore of the Land Dayaks in particular, and descent is often claimed from Javanese royalty. At the other end of the scale the Brunei records show the royal family of Brunei marrying into that of Java in the time of the sixth sultanate. The Kedayans are in one version said to have been brought over from Java and presented to the Sultan of Brunei in payment of gambling debts by a Javanese prince defeated in a great cock-fight. However, other versions contradict this.

The great Hindu empires associated with Java appear to have had very little direct influence in west Borneo (Harrisson, 1949), but there is evidence for peaceful influences far inland on the south-east side of the spinal range, including the fifth century Kutei inscription, 100 miles inland in south-west Borneo (Vlekke, 1945; Coedes, 1948). It is along this overland line that the other islands of the Indies have exercised great influence, and today the Land Dayaks still show Hindu traits (Elam, 1937).

From the north, the Philippines have given and taken much to and from Borneo; but on present evidence this was only slight as far south as Brunei and negligible thereunder.

Other influences on the Bornean blood-stream are so slight, as far as the present study is concerned, that they may be ignored. They include Arab, Indian and European.

The total picture that emerges (despite very inadequate data on many points) is the complexity of impacts and influences in west Borneo. This does not mean that there are not, by present standards, quite "pure" groups. It does mean that the existence of simple single-origin homogeneous groups, dating back more than five centuries, is improbable except in the interior. All the groups in the present study live on the coast or a few hours from it. The degree of their specialization and peculiarity is therefore one index of the processes involved both in Borneo societies and in blood grouping in general.

Before the sample material itself is considered, it seems worth while to sum up what is known of each of the five ethnic groups studied, in so far as the information is relevant to this paper.

The Sampled Peoples.

The areas from which the samples were drawn are indicated by shading in Figure I, which also shows boundaries of the administrative divisions.

Brunei.

The two ethnic groups sampled in the State of Brunei are closely associated yet clearly distinguishable.

Bruneis.

Most of the 50 Bruneis sampled (all in March, 1949) lived in Brunei town, which is really a group of lovely villages built on stilts in the wide river.

The Bruneis, of whom there are about 16,000, are "Malays" with a local background of admixtures (already discussed). The principal original element in their population was probably Murut. The term Murut as used in west Borneo differs from that in north Borneo (Bolang and Harrisson, 1950). These western Muruts inhabit a great area from Brunei Bay into the uplands round Mount Murud (8000 feet, and highest in Sarawak); the name of the peak derives, as does theirs, from the word "mountain" —and by extension "mountain people". Past Mount Murud they stretch away far across the Indonesian border, where they are called Potoks, Kelabits and Milaus, and practise an advanced form of irrigated rice cultivation. The Muruts close to Brunei town were decimated by the depravities of the Brunei court in its late decline, vividly described by the talented eye-witness Sir Spenser St. John (1862); it is indeed remarkable that they have retained their identity at all on the coastal belt.

The Murut base has been overlain by six centuries of fairly separate identity under Islam, which is nevertheless an invisible influence of importance. For clearly it was not only the sultanate, but also many followers, who "went Islam" to found this Malay State.

Although it was realized that the sampling was too small to be regarded as representative, it was hoped that some evidence of sociological relationship and of differences between Bruneis and Kedayans would be revealed.

Kedayans.

The 178 Kedayan samples were collected in March, 1949, at the government agricultural stations at Kilanas and Malaut, approximately half at each place.

The Kedayans, who are Mohammedans and speak a dialect of Malay difficult to understand for those who know only ordinary Malay, are essentially rice agriculturists. In the 1947 census there were 6726 in Brunei and 3292 in Sarawak (where they live in settlements scattered along the coast).

There are a number of legendary origins of the Kedayans, that of the cock-fight having already been cited. Much play has been made with the word itself, but it is only a Malay modified form of the root *daya* already discussed, *plus* prefix and suffix. The Kedayans are also sometimes said to derive from an intermarriage of Malays and Chinese. It is probable that the present-day Kedayans are as mixed in origin as most Borneo groups, though they have stoutly preserved their identity, craftsmanship, industry and outlook while living alongside and amongst the Bruneis, who tend to look down upon them and consider them the descendants of slaves. In recent times, therefore, they have remained unusually "pure".

Sarawak.

The three groups sampled in Sarawak are all Dayak from that section of Dayaks living in relatively accessible subcoastal areas. The more isolated Dayaks of the interior —Kayans, Kenyahs, Sebops, Punans, Kelabits *et cetera*— have not been covered in the present study and offer important subjects for the future.

Melanaus.

The material from 176 Melanaus was collected in two groups.

The first group was collected from the inhabitants of the widely dispersed fishing village of Oya in the centre of the area populated by Melanaus. About one-third of the samples were collected in the shop-centre of the village, a further one-third from the Kampong Snowl, one mile nearer the sea, and the remainder from a small collection of houses across the river. These were all Melanaus who had adopted Mohammedanism. In addition, 10 samples were taken from pagan Melanaus in a small colony at Sibu, a town on the Rejang River, now predominantly Chinese.

The second group was collected mostly from Medong, a village of about 2000 inhabitants 10 miles up the Oya River; 20 samples were obtained from Kut (population 500), 10 miles up the Igan River, with a strong Malay admixture, and 30 from Kampong Guasson, 10 miles further up the Igan, where racial admixture is even heavier.

The first group was forwarded by sea to Kuching, thence by air via Singapore to Melbourne in ice-packed vacuum flasks, arriving on June 7, 1949, ten days after collection. Of the 100 samples sent, 44 had to be discarded owing to lysis.

The second group was collected on March 30 and 31, 1950. During transit from Medong to Sibu (two days) the material was kept in a flask of ice-cream, ice being unobtainable in that remote locality. From Sibu it was sent on ice to Kuching, thence in vacuum flasks to Melbourne. Tests were commenced on this series on May 16, 1950, and completed ten days later. A number of samples had to be discarded owing to lysis, and a few were found to be pan-agglutinable.

The mixed character of the two series is typical of the Melanau situation. There is no such thing as a "pure" Melanau. Apart from Malayoid influences, an element in the Melanau stock was provided by "Dayaks" from the far interior, moving north-west and west as the Kenyahs and subsequently the Kayans have done in recent centuries. These proto-Melanau people inhabited the upper Baram and Rejang Rivers when the first Kenyahs arrived from the east and pushed them down river. To the north in the Baram these earlier tribes were known as Metings, Narums, Lelaks, Baliongs *et cetera*. Elements of these moved down to the coast to become the Melanaus of the Miri-Niah area. Further south the equivalent Rejang groups were Kapits, Kanowits, Sekapangs *et cetera*; elements of these settled the Oya-Medong area sampled in this study. The "old" groups are now sadly reduced in numbers inland, and the Melanaus are their only prosperous offshoots (Harrisson, in the press, *b*).

Today the Melanaus are primarily sago-eaters (as were their ancestors inland, the "Kelamentans" defined by Hose and McDougall, 1912) and fishermen. They now inhabit some 200 miles of the coast and coastal plain. As is often the case, the Mohammedan Melanau tends to be more easy-going and less energetic, colourful, ritualistic or acquisitive; this does not necessarily indicate any "degeneration". The evolution of the Melanaus in this century is only the repetition of a process which has been going on in various ways for centuries and has obliterated some groups altogether. The most conspicuous similar cases in point at present are the mass-conversions to Christianity of Kayans, Kenyahs and Sea Dayaks, with tremendous implications for the future of these previously specialized groups, each with its own peculiar and highly complex set of rituals and beliefs.

Land Dayaks.

The 97 samples from Land Dayaks were all taken on November 19, 1948, at Segu, a group of long-houses containing (at the 1947 census) 321 males, 303 females. The material was sent to Melbourne by air in special ice-packed boxes. Tests were completed within a fortnight of collection. As far as possible, children and family groups were avoided in the sampling. Segu is 21 miles from Kuching, the capital of Sarawak, at the end of one of the country's few roads.

In this south-west corner of Sarawak the Land Dayaks are the dominant people inland and in the foothills. They stretch far across the Indonesian border, and have migrated into Sarawak continuously for many centuries; they continue to do so.

The Land Dayaks, though notably subservient to the Malays in some ways, retain their own culture and outlook. Until recently they have resisted mass-conversion to Christianity. Being easily accessible, they have been influenced by all who have settled in the rich south-west, and they live on and about the goldfields on both sides of the border, where Chinese influence is still paramount.

There are various branches—Larah, Selakau, Jagoi *et cetera*—probably of one stock originally. The Bidayuh branch on the Sadong remember the complex genealogies and migrations of their long-house units over centuries (Roberts, 1950). The most noticeable difference between these and other Dayaks is the construction of a separate house for human heads, beside the long-house; other Dayaks keep the heads on the long-house verandas. The habit of cremating the dead (possibly due to Hindu influence) is also peculiar to the Land Dayaks.

Segu is a unit with a strong sense of its own unity. Admixture is minimal—there is no shame in confessing such admixture in most communities, and a Chinese or Malay ancestor is usually a subject of pride. The restrictive factor is rather from the other side, the Land Dayaks being looked down on by the other peoples of the area.

Sea Dayaks (Ibans).

The 83 samples from Sea Dayaks were taken at Sungei Assan, a tributary of the Rejang River, and nearby long-houses. As far as possible children and family groups were avoided in the sampling.

The Sea Dayaks are so called confusingly because they were first encountered by Europeans at sea, on pirate raids in their great war boats. They never live by the sea, but inhabit the sub-coastal area and the foothills north and east of the Land Dayaks. In the second division (southern limit) they are divided into Balau, Saribas, Milikin *et cetera*. In the third division (Rejang River *et cetera*), where this sample was taken, they are most numerous and are generally called Ibans. In the fourth and fifth divisions there are smaller numbers who represent migrations during this century, for the Sea Dayaks are the latest of the Dayak immigrants into west Borneo, and are still pushing north and west. From the headwaters of the Kapuas and adjacent rivers in Indonesian Borneo they came over, probably less than four hundred years ago, into the second division and thence pushed north, multiplying rapidly both by further immigration and by their own fertility. They are still increasing rapidly, and are the most dynamic, energetic and pushful of the Dayaks. While some are still rigorously pagan in the old tradition, many are turning to Christianity. These latter are rapidly acquiring educational standards, cooperative societies, electricity in their long-houses and refrigerators.

The Iban part of the Sea Dayaks, here sampled, are the least influenced by outside standards, and their physical

admixture with other peoples (in the past five centuries at least) is slight by Borneo standards. The most significant other element is their absorption of preexisting weaker peoples whom they overrun, often obliterating the male population and taking over the women. In the third division this Ibanization of other Dayaks, parallel to Islamization by the "Malays", is to be seen now with the last of the Serus at Saratok, in the eclipse of the Kanowits at the place of that name, and in the eclipse of the Panan Batu and Bukitan in the middle Rejang.

Ethnic Summary.

Thus it will be seen that the five ethnic groups studied in this paper represent, fairly well, the general pattern of intricate interchange and admixture in west Borneo, and in Borneo as a whole.

No one of the groups can, from one basic angle, be regarded as "pure". The Kedayans are probably, in this sense, the purest. The Land Dayaks have been little affected in recent times, especially at places like the Segu village of this sample. The Sea Dayaks have only a fractional absorption from other and earlier groups. The Bruneis and Melanaus of today probably date back, as recognizable groups, only a few centuries, and the Melanau remain an ethnic tangle of the first order.

All these people can be regarded as having come mainly or wholly across from south and east of Borneo, migrating overland, north and west—with the qualification that part of Kedayan ancestry may have been imported direct by sea, while the Bruneis include an element directly arriving from the west (Malaya, Arabia *et cetera*), impacting on an overland migrating group (the Muruts?). Brunei also has a tie-up to the north-east (Philippines), which would become important in any sampling further north in the colony of north Borneo, but is weak as far south as Sarawak. Finally, a very significant, largely direct, influence into Sarawak populations has come from the north in seasonal movements (now extinct, because of steam) by the Chinese junk fleets, bringing especially ceramics and metals in return for gems, spices, hornbill ivory and much else.

The ethnic literature of west Borneo is scanty. The principal general work by Hose and McDougall (1912) is now out of date, and theorists of south-east Asian populations have had little fresh material of a scientific standard upon which to draw. Extensive field work has been undertaken since the war, however, and results are beginning to appear. This work has been undertaken either through the Sarawak Museum (which is also supported by the Government of Brunei) or by anthropologists sent on one-year or two-year visits through the Social Science Research Committee drawing on United Kingdom treasury funds. The present ethnological contribution by one of us (T.H.) is based on the general situation of knowledge for the area and is as up-to-date a summary as is possible. Further research is likely to modify the picture again.

Materials and Methods.

Tests for the A B O groups and subgroups and for M–N and Rh types were carried out on slides by methods described fully in previous papers. Potent sera giving clear-cut reactions with a comprehensive series of control blood samples which had been stored for various periods were used for each blood group system.

Collection of Blood Samples.

Two to four drops of blood obtained by finger puncture, after careful cleansing of the part with ether, were transferred aseptically to one-millilitre volumes of a glucose-citrate solution (Simmons and Graydon, 1945) in solid rubber-stoppered vials. The samples were kept chilled until their transfer to ice-packed vacuum flasks immediately prior to their dispatch by sea or air to Singapore, whence they were flown to Melbourne after the flasks had been recharged with ice.

Collection of Saliva Samples.

Sterile one-ounce jars fitted with screw caps and rubber inserts were used for the collection of saliva. Immediately after collection the caps were screwed down tightly and the bottles placed in boiling water for fifteen minutes or longer. The samples were forwarded by sea to Melbourne. Unfortunately the saliva had dried out before it reached the laboratory. Before the testing a suitable method of extracting the dried saliva had to be devised. Saliva obtained from laboratory donors was dried by being placed in a boiling water bath. Subsequently watery and saline extracts were made, and these were tested for inhibiting substances by the usual techniques. It was found that the extracts were considerably weaker in group-specific substance than were the original wet saliva samples. However, they could be used with appropriate adjustment of dilutions.

Results and Discussion.

The A B O blood grouping results for the five groups together with calculated gene frequencies are given in Table I. This table reveals several contrasts in distribution. The two groups to which the name Dayak is still applied —the Land Dayak and the Sea Dayak or Iban—have contrasting blood group frequencies. There were 39% of group B amongst the Land Dayaks examined and only 19% of that group in the Ibans. Although the number of samples tested was small, the observed differences between these two groups were highly significant ($\chi^2 = 10{\cdot}1$, $P < 0{\cdot}01$). The calculated frequency of *q*, the gene for group B in the Land Dayak, was 0·295, which is very high, particularly for the races inhabiting the islands of the south-west Pacific area. In fact, the distribution of the A B O groups in this small sampling of Land Dayaks was unlike that of any other race examined in the entire Pacific area, but is rather similar to that found by Wiener *et alii* (1945) in Moslem Indians.

The Sea Dayak A B O frequencies are not very different from those observed by us in some native groups of New Guinea, in Fijians, and in a very small series of Ambonese (Simmons *et alii*, 1949).

The picture presented by the Kedayans likewise differs from those of the other groups of this series. Here it is the high frequency of group A (44·4%) which is outstanding. The frequencies are not like those found in Javanese or other Indonesian groups.

Table I.

A B O Blood Groups and Gene Frequencies in Borneo.

Racial Group.	Number of Blood Samples Tested.	Blood Groups.				Frequency of Genes.		
		O	A_1	B	A_1B	*p*	*q*	*r*
Land Dayaks	97	26 (27%)	20 (21%)	38 (39%)	13 (13%)	0·171	0·295	0·518
Ibans (Sea Dayaks) ..	83	31 (37%)	27 (33%)	16 (19%)	9 (11%)	0·225	0·141	0·611
Melanaus	176	77 (43·75%)	33 (18·75%)	49 (27·8%)	17 (9·7%)	0·129	0·185	0·661
Kedayans	178	51 (28·7%)	79 (44·4%)	36 (20·2%)	12 (6·7%)	0·319	0·164	0·535
Bruneis (Malays) ..	50	19 (38%)	12 (24%)	18 (36%)	1 (2%)	0·17	0·24	0·62
Total Borneo	584	204 (34·9%)	171 (29·3%)	157 (26·9%)	52 (8·9%)	0·210	0·195	0·591

The sampling of Bruneis was really too small for much reliance to be placed on the results. Nevertheless, the frequencies found approximate to those of the Malay Indonesian groups that have been tested to date, and are therefore in accord with the origin of this Malay group of Borneo.

Although little is gained by pooling frequencies found in diverse races, the totals have been given in Table I. Of the 584 samples examined, 204 (34·9%) were of group O, 171 (29·3%) were of group A_1, 157 (26·9%) were of group B and 52 (8·9%) were of group A_2B. Gene frequencies calculated from these results were $p = 0·210$, $q = 0·195$ and $r = 0·591$. The 223 samples of groups A and AB belonged to subgroups A_1 and A_2B respectively, which adds further to the list of coloured races in which the subgroup A_2 is absent or extremely rare.

TABLE II.
M-N Types and Gene Frequencies in Borneo.

Racial Group.	Blood Samples Tested.	M-N Types.			Gene Frequencies.	
		M	MN	N	*m*	*n*
Land Dayaks..	97	38 (39%)	45 (46%)	14 (14%)	0·624	0·376
Ibans (Sea Dayaks).	83	17 (20%)	41 (49%)	25 (30%)	0·452	0·548
Melanaus ..	176	36 (20·4%)	97 (55·1%)	43 (24·4%)	0·480	0·520
Kedayans ..	178	52 (29·2%)	101 (56·7%)	25 (14·0%)	0·576	0·424
Bruneis (Malays)	50	18 (36%)	27 (54%)	5 (10%)	0·63	0·37
Total Borneo	584	161 (27·6%)	311 (53·2%)	112 (19·2%)	0·542	0·458

The Melanau frequencies have no striking features, but they do show a fairly high incidence of group B accompanied by the lowest percentage of group A in the series. Perhaps frequencies found by the present authors in the Philippines are nearest to those of the Melanau.

Table II summarizes the results of M–N tests and presents also gene frequencies calculated from them. It will be noted that the frequency of *m* fluctuates about an average value of 0·542, which is similar to that found in most races with a few notable exceptions—namely, the Australian aborigines, Papuans and Marshallese, who have much lower *m* frequencies, and the American Indians, Eskimos and some Bedouin tribes of Syria, who have high *m* frequencies. However, even in this system the Land Dayak and Iban frequencies differ significantly ($\chi^2 = 10$, one degree of freedom), and the latter again depart appreciably from those of the Javanese and Bruneis. Kedayan frequencies are more akin to those of the Javanese in the M–N system, whilst the Melanau figures are again not far removed from those of the Filipinos.

M_2 Variants.

When the M–N tests were performed on the earlier series, those comprising samples from Land Dayaks and Sea Dayaks, we had no means of determining the presence or absence of an M_2 variant. The subsequent discovery of an example of this variant in a family in Melbourne (Jakobowicz *et alii*, 1949) made it possible to test the later series for such a variant. Two anti-M and two anti-N sera were used, each having been produced in rabbits by injecting cells of individual donors of group M and group N respectively. The anti-M sera when used in parallel were capable of detecting M_2 variants of the type reported above.

No example of this variant was found in the series from Melanaus, Kedayans or Bruneis, all samples from which were examined by the four sera.

M_2 variants are rare in the white races, so it was not expected that they would be found in small samplings of coloured races. However, the possibility that such variants might be common in certain races despite their rarity in the whites was of sufficient anthropological importance to warrant a search in surveys of this type. To date no M_2 variant has been found in investigations on Australian aborigines, Papuans, Chinese, Indonesians and Maoris. It is therefore becoming less probable with each new survey that this particular variant will prove of significance in anthropology, although it is not impossible that other undetected variants at the M–N locus may be more common and may have real value in determining racial differentiation.

The results of M–N–S tests carried out on Kedayan and Melanau samples are summarized in Table III, in which findings reported to date for other races are given for comparison. "Chromosomal" frequencies calculated from these results are also given in Table III.[1]

[1] The frequencies of the chromosomes as given in Table III were calculated as under:

$ms = \sqrt{M}$;
$mS = \sqrt{M + MS} - \sqrt{M}$;
$ns = \sqrt{N}$;
$nS = \sqrt{N + NS} - \sqrt{N}$.

Corrections were then made having regard to the following:

(i) $m = ms + mS = M + MS + \frac{MN + MNS}{2}$

$n = ns + nS = N + NS + \frac{MN + MNS}{2}$

(ii) $mS + nS = 1 - \sqrt{M + MN + N}$
$ms + ns = \sqrt{M + MN + N}$

which ensure that the sum of the frequencies is unity.

TABLE III.
M-N-S Types and Chromosomal Frequencies in Various Races.

Population.	Authors.	Number Tested.	M-N-S Phenotypes.						S-Positive (Percentage.)	Frequency of Chromosomes.			
			M	MS	MN	MNS	N	NS		*ms*	*mS*	*ns*	*nS*
Melanaus ..	Present authors	100	16	1	56	2	25	—	3	0·44	0·02	0·54	—
Kedayans ..	Present authors	49	13	2	26	4	2	2	16	0·57	0·04	0·29	0·10
Australian Aborigines.	Sanger (1950)	178	14	—	63	—	101	—	0	0·256	—	0·744	—
	Simmons and Graydon (1950)	32	—	—	4	—	28	—	0	0·06	—	0·94	—
New Guinea Natives.	Sanger (1950)	141	7	1	30	13	72	18	22·7	0·149	0·052	0·715	0·084
New Guinea Natives, Central Highlands.	Simmons and Graydon (1950)	30	—	—	2	1	17	10	37	0·04	0·01	0·75	0·20
Maoris	Simmons, Graydon, Semple and Taylor (in press).	148	37	1	65	11	28	6	12·2	0·500	0·014	0·438	0·048
Marshallese ..	Simmons, Graydon and Semple (in press).	305	22	—	81	18	133	51	22·6	0·234	—	0·651	0·115
English	Sanger and Race (1947) ..	190	14	36	38	57	30	15	57·0	0·285	0·255	0·386	0·074
	Pickles (1948)	250	20	55	63	67	33	12	53·5				
Australian Whites	Walsh and Montgomery (1947)	140	9	30	27	40	21	13	59·3	0·285	0·261	0·385	0·069
	Simmons and Graydon (1950)	220	20	48	62	50	32	8	48·2				

In accordance with long-standing usage in regard to this system, lower-case letters have been used for the genes *m* and *n* and capital letters for phenotypes. However, to denote the gene for the "Sydney" factor, which is a Mendelian dominant, a capital S is used, and a lower-case s is used to denote its allele, which behaves as a recessive in tests with anti-S serum. The four chromosomes thus become *ms*, *mS*, *ns*, *nS*; this notation, though inconsistent, is practical and will be used until a more satisfactory one receives general recognition. It is apparent from Table III that the "Sydney" factor is widespread and varies greatly in frequency among the races of the world. Because of this it is likely that with extension of its investigation the M–N–S distribution will eventually assume great anthropological significance. The chromosomal frequencies as calculated provide more information than the S-percentages alone, for it would be possible to have two populations with the same S-positive percentage but with widely differing frequencies of *mS* and *nS*.

Several points of interest are revealed by the comparisons of the table. The white Australian and English series are almost identical; this may be regarded as confirmation of the accuracy of the techniques used. The chromosome *mS*, which is common in whites, is uncommon in the coloured races, and must be rare or entirely absent in Australian aborigines and Marshallese. It has been repeatedly mentioned that the majority of the peoples of the world have *m* frequencies in the 0·5 to 0·6 range. Two such groups, Kedayan and English, represented in this table, are clearly differentiated by means of the M–N–S chromosomes.

There is also a wide range of variation in the *nS* frequencies, which reach their highest in the natives of New Guinea and the Marshalls. Despite the geographical proximity of New Guinea and northern Australia there appears to be no S antigen in the blood of Australian aborigines.

The two groups from Borneo differ from each other and the other groups listed. The Melanau, like the Australian aborigines, are characterized by the absence of the *nS* chromosome; but, of course, they are unlike in respect to the other chromosomes.

No S figures have yet been published for peoples living along the migration routes of the tribes of Borneo or for any race thought to be related to them. These, when available, may prove of material value in resolving such kinships. As indicative of the stability of the S antigen and incidentally of the accuracy of the S tests here reported, it may be stated that repeat tests with anti-S serum (Pickles 1/6) on the Melanau and Kedayan samples four months and six months respectively after collection gave results identical with those obtained immediately on receipt of the samples in Melbourne. The samples had been stored, undisturbed, at 5° C. during this period.

The results of tests with Rh-typing sera are shown in Table IV, which also gives gene frequencies calculated from the findings. It was necessary to assume the presence of only four of the eight main Rh genes. In some of the series it was impossible to distinguish between genes R^0 and *r*, one of which must have been present to account for the occurrence of a phenotype giving "++−+" reactions with anti-D, anti-C, anti-E and anti-c respectively. The finding of two examples of phenotype Rh_0 proved the presence of gene R^0 and made it likely that that gene was responsible for the "++−+" reactions observed. However, both of these genes may have been present in the series; but as we had no reason or need to assume that gene *r* exists in Borneo, we have recorded the sum of the frequencies of R^0 and *r* as R^0 probably without introducing significant error.

Further, as there were no means of distinguishing between genes R^y and R^z, the frequencies recorded for R^z in the table really represent the summation of the frequencies for R^y and R^z. Both have been found in the white races; but R^z, though uncommon, occurs far more frequently than the extremely rare R^y, which provides justification for its preference in the present case.

In all the groups examined gene R^1 (CDe) was by far the most common, having an average frequency of 0·873, which approximates that found for the same gene in most other races of the western Pacific, the outstanding exception being the Australian aborigines (frequency of $R^1 = 0{\cdot}564$). It would appear that this gene is uniformly distributed amongst the pagan races of Borneo.

The finding of six individuals of phenotype Rh_1Rh_2 amongst the 178 Kedayans tested indicates a relatively high frequency of R^2 in this race. This gene is possibly present in all the groups, but has shown up only in the Kedayans, Ibans and Melanaus.

The gene R^2 has a frequency in the Land Dayaks almost identical with that reported by Phansomboon, Ikin and Mourant (1949) for Siamese, and this is in pronounced contrast to the high figure found in Polynesians (Maoris; Simmons, Graydon, Semple and Taylor, 1951). Again, the whole Rh distribution in the Melanau resembles that reported for the Filipinos.

Rh Antigens C^w and D^u.

At the time the samples from the Land and Sea Dayaks were examined we had no means of testing for the Rh allelomorphs C^w and D^u, which are active at the C and D loci respectively. However, we were able to include tests for both in the later series. For the C^w tests the serum used was a sample kindly sent to us by Dr. R. R. Race; it was used in the way outlined by Simmons and Graydon (1950). With it five examples of C^w were found in 300 white Australians. No positive reactions were obtained with 100 random blood samples of all groups from Melanaus or in 49 random blood samples from Kedayans. To date this variant has not been detected in any coloured race.

TABLE IV.

Rh Types and Gene Frequencies in Borneo.

Racial Group.	Number of Blood Samples Tested.[1]	Rh Phenotypes.						Rh Gene Frequencies.			
		Rh_1Rh_1	Rh_1Rh_0	Rh_2	Rh_0	Rh_1Rh_2	Rh_1Rhz	R_1(CDe)	R_2(cDE)	R_0(cDe)	Rz(CDE)
Land Dayaks	97	73 (75%)	4 (4%)	3 (3%)	0	17 (18%)	0	0·867	0·112	0·021	—
Ibans (Sea Dayaks) ..	83	65 (78%)	5 (6%)	0	0	11 (13%)	2 (2%)	0·885	0·070	0·033	0·012
Melanaus	172	139 (80·8%)	11 (6·4%)	3 (1·7%)	1 (0·6%)	17 (9·9%)	1 (0·6%)	0·899	0·055	0·036	0·010
Kedayans	178	138 (77·5%)	11 (6·2%)	0	0	23 (12·9%)	6 (3·4%)	0·876	0·070	0·035	0·019
Brunei (Malays) ..	50	27 (54%)	8 (16%)	2 (4%)	1 (2%)	12 (24%)	0	0·732	0·161	0·107	—
Total Borneo	580	442 (76·2%)	39 (6·7%)	8 (1·4%)	2 (0·3%)	80 (13·8%)	9 (1·6%)	0·873	0·079	0·039	0·009

[1] All samples tested were Rh-positive—that is, anti-D positive.

The search for the D^u antigen was made by testing 114 blood samples with three anti-D and two anti-D+D^u sera and a further 211 samples with one anti-D and one anti-D^u serum. These sera had been selected from 19 different anti-D sera by tests with blood samples of Stratton's original D^u cells (Abel), which had been kindly forwarded to us by Dr. P. Renton of Manchester, England.

Altogether 97 Melanau, 50 Brunei and 178 Kedayan blood samples and a few from miscellaneous tribes were tested with the selected sera. All these tests gave positive results, indicating the absence or rarity of Stratton's D^u antigen in these groups. This contrasts with the common occurrence of "intermediate" types (?D^u) in American Negroes.

Tests for the agglutinogen P were performed on samples from Kedayans and Melanaus.

Although Landsteiner and Levine first reported this blood factor at the time of their discovery of the M and N agglutinogens, now over twenty years ago, the latter have received far greater attention from workers in this field. Perhaps this is due partly to the lack of potent and reliable sera and partly to the difficulties occasioned by the wide range of intensity of reactions obtained with anti-P sera. Our tests were carried out on slides at 5° C., readings being taken at one hour. With the serum used readings had to be made very quickly after its removal from the cold room, because the agglutinations disappeared rapidly as the slides grew warm. The agglutinations reappeared on cooling again to 5° C. This fact enabled the results of one worker to be checked by later readings taken by another. The dual readings proved to be consistent.

One hundred Melanau and 49 Kedayan samples were tested, and yielded 75% and 71% positive results respectively. These percentages are close to those reported for the white races and for Mexican Indians (Wiener *et alii*, 1945), but are very different from those reported for American Negroes, who are almost 100% P-positive.

Tests for the Lewis blood group were performed on samples from Kedayans, Bruneis and Melanaus according to the technique outlined by Simmons and Graydon (1950). In April, 1949, 58 group O samples from Kedayans and Bruneis were tested with anti-Lewis (Le^a) serum between three and four weeks after their collection in Brunei. Thirteen positive results were obtained, but of these three were weak reactions, probably owing to the age of the cells.

Because it was thought that some additional light might be thrown on the correlation between Lewis reactions and secretor tests, investigation of these properties in coloured races was commenced as an integral part of our blood surveys.

Tests on saliva and blood samples from the same individuals, members of the Kedayan groups, were unfortunately marred by a succession of minor mishaps which rendered them more difficult to perform.

Owing to breakage of a "Thermos" flask in transit, the blood samples were held in Brunei on ice awaiting replacement and were not received in Melbourne until three months after collection. Reactions with these cells tested against anti-Lewis (Le^a) serum were not so strong as those with fresh cells.

The saliva samples when received had dried out and the original volumes of the samples could not be determined. They were extracted with 0·5 millilitre of saline for thirty minutes at 80° C. In tests for inhibition against suitably diluted A and B sera the extracts were diluted 1:10, but for anti-O tests (anti-H of Morgan) the extracts were used without further dilution. Tests showing definite but incomplete inhibition were regarded as giving positive results. The actual technique of testing was that described by Simmons, Semple and Graydon (1951).

A total of 43 Kedayans was tested for both the Lewis (Le^a) and the secreting factor. Thirty-five of these were found to be Lewis-negative secretors, five were Lewis-positive non-secretors, two appeared to be Lewis-negative non-secretors and one a Lewis-positive secretor. Thus there were three exceptions to the Lewis-secretor status correlation. Two of these results, the negative reactors, might be attributable to deterioration of the cells or saliva; but the remaining exception can hardly be explained in that way. It seems likely that this exception at least is real, and that among the Kedayans there is a low incidence of individuals who do not conform to the rule that the Lewis (Le^a) antigen and the non-secretor status are associated. Infrequent exceptions in the white races have been reported. The 104 Kedayan samples tested with anti-Le^a serum gave 19 positive reactions.

Subsequently a series of 100 random blood samples of all groups of Melanaus was tested with anti-Le^a serum and yielded 14 strongly positive reactions and 86 negative results. In this group the cells were seven weeks old when tested, but no difficulty was experienced owing to the age of the cells.

From these results it would appear to be safe to assume that about 14% of Melanaus are Le^a positive and are therefore likely to be non-secretors of the A, B and H substances.

Interpretation of the results obtained in this survey is rendered difficult by the paucity of data for related and neighbouring native groups. However, during the discussion of the results several comparisons have been made.

It would seem that the Kedayans differ from the Javanese and other Indonesian groups with whom they have affinities in their high frequency of the A gene. Differences between Kedayan and Brunei frequencies are more pronounced, but little weight can be placed upon these observations because the number of Bruneis tested was so small.

The A B O and M–N frequencies of the Land Dayak and Hindus from Asia proper are very similar; the high frequency of q in the former would be consistent with a considerable Hindu component which, if present, would be expected to introduce also the Rh-negative gene which was not revealed in our series. Land Dayak frequencies are also strikingly similar to those reported for Siamese (Phansomboon, Ikin and Mourant, 1949), and except for the high value of q are like those found in southern Chinese (Simmons *et alii*, 1950).

A common factor in Sea Dayaks and groups in New Guinea, Amboina and Fiji is suggested by similar A B O frequencies. The same factor may also have produced a frequency of gene m in the Sea Dayak lower than in any of the other groups examined in this survey. This is in line with their entry into Borneo from the east, with subsequent north-westerly migration across the island.

The observed differences in gene frequencies between the Land Dayaks and the Sea Dayaks indicate different origins, a finding substantiated in their modern cultural differences.

Although influence from the Philippines is considered to have been negligible further south than Brunei, the similarity of Melanau and Filipino frequencies in all three blood group systems suggests a strong affinity between these groups.

Ethnological evidence has shown the complexity of the racial picture in Borneo, particularly of the coastal peoples, and this is substantiated by the blood group findings.

Knowledge of gene frequencies in groups inhabiting inland areas of Borneo, particularly those who are living in regions through which the north-westerly overland migrations must have passed, and who would be unaffected by the factors which have influenced the coastal peoples, would throw light on the degree of admixture experienced by the latter.

Critical analysis of the present results would be better deferred until such information is available.

SUMMARY.

1. The blood groups and the M–N and Rh types of 584 natives of Sarawak and Brunei in north-west Borneo have been determined (580 only were tested for the Rh factor). Of the racial groups represented in the sampling there were 97 Land Dayaks, 83 Ibans (Sea Dayaks), 176 Melanaus, 178 Kedayans and 50 Bruneis.

2. The ethnology of the peoples of Borneo is discussed, particularly in relation to the groups included in the present study.

3. The blood group percentages found in the 584 samples were as follows: group 0, 34·9; group A, 29·3; group B, 26·9; group AB, 8·9. The 223 individuals of groups A and AB were found to belong to subgroups A_1 and A_1B respectively. Gene frequencies calculated from these figures

were as follows: $p = 0{\cdot}210$, $q = 0{\cdot}195$, $r = 0{\cdot}591$. The results obtained for the separate ethnic groups have been presented in a table.

4. The M–N type percentages were as follows: type M, 27·6; type MN, 53·2; type N, 19·2. From these the gene frequencies $m = 0{\cdot}542$ and $n = 0{\cdot}458$ were calculated. No M_2 variant was detected in the Melanau, Kedayan and Brunei samples, of which there were 400 in all. The Land Dayak and Iban samples were not tested for this variant.

5. The Rh types found in 580 samples were as follows: Rh_1Rh_1, 442 (76·2%); Rh_1Rh_0, 39 (6·7%); Rh_2, 8 (1·4%); Rh_0, 2 (0·3%); Rh_1Rh_2, 80 (13·8%); Rh_1Rh_z, 9 (1·6%). The calculated gene frequencies were as follows: R^1(CDe) = 0·873; R^2(cDE) = 0·079; R^0(cDe) = 0·039; R^z(CDE) = 0·009.

6. No D^u variants were detected in 325 samples, which were taken from 97 Melanaus, 178 Kedayans and 50 Bruneis.

7. No C^w variant was detected in 100 Melanau and 49 Kedayan blood samples.

8. Of 100 Melanau and 49 Kedayan samples tested for agglutinogen P, 75 and 35 (71%) respectively gave positive reactions.

9. The same 149 samples were tested for the "Sydney" ("S") factor. Three positive reactions were observed in tests on 100 Melanau samples and eight positive reactions were observed in the tests on 49 Kedayan samples. These findings are compared with those reported for other races in a table giving both phenotypes and gene (chromosome) frequencies.

10. Of 104 Kedayan and 100 Melanau samples tested with anti-Lewis (Le^a) serum, 19 and 14 respectively gave positive results.

11. Saliva and corresponding blood samples taken from 43 Kedayans were examined for group-specific substances and the Le^a factor respectively. The three cases in which correlation was not found are discussed.

12. Some comparisons with gene frequencies observed in other races are made.

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SOME DIAGNOSTIC PROBLEMS OF SCABIES.

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THE discovery of the itch mite, *Sarcoptes scabiei*, is generally credited to Bonomo, who in 1687 reported that he had seen Corsican peasants skilfully extracting the mites from their skin as a primitive means of treatment. He carefully examined the mites with the aid of a microscope, and published drawings of them; he even suggested that the presence of these mites in the skin was the cause of "the itch". During the following century this finding was amply confirmed, and thus scabies slowly became accepted as an entity out of the multitude of itching skin diseases.

Nowadays scabies is diagnosed by isolating an itch mite from a burrow on a patient, in the absence of which reliance must be placed on the presence of mite burrows on hands or wrists or elsewhere, together with an excoriated red papular rash situated predominantly on the sides and webs of fingers, ulnar border of hands, front of wrists,

elbows, anterior axillary folds, abdomen, buttocks, male genitals, female breasts, and in babies the palms, soles, ankle creases and occasionally the face. The papules may become urticarial or even vesicular, and the excoriations commonly become secondarily infected with pyogenic bacteria, resulting in a polymorphous eruption.

Despite this basic teaching the diagnosis of scabies is not always easy, and since an incorrect diagnosis leads to incorrect treatment, a few of the diagnostic pitfalls will be described.

CASE I.—A rather reserved bachelor, aged fifty-two years, presented complaining of an itchy papular rash on his trunk and limbs of one week's duration. No mite burrows could be found on his hands, wrists, genitals, or elsewhere. He denied contact with anyone who had an itching skin disease, he had taken no medicines, eaten no unusual foods, come into contact with no unusual soap or other substances, nor had he had any noteworthy emotional upset.

An antipruritic zinc oxide lotion was prescribed and he was examined again a week later.

His itch was still troublesome, and examination now revealed one mite burrow on the front of one wrist, together with a slightly excoriated papular eruption scattered rather haphazardly over his trunk and limbs. The itch mite was extracted from the burrow with a needle and was shown to him on a slide under low power of a microscope. Thorough treatment being thus ensured, he was quickly cured by two chin-to-sole applications of 25% benzyl benzoate emulsion.

Several instructive features are present in this instance.

Firstly, the failure to diagnose scabies on the first examination was due chiefly to the absence of mite burrows. This would appear to be due to the cleanliness of the patient, because burrows tend to be opened up and erased by repeated scrubbings of the affected parts. If burrows are absent, but the eruption is otherwise typical of scabies, and the patient has been in close contact with one or more sufferers from indisputable scabies, it would be permissible to diagnose scabies presumptively and to treat accordingly. In this case, however, the distribution of the eruption was not typical, and there was no evidence of such contact, so one could only adopt a wait-and-see policy. When the patient was examined a week later and a scabies mite demonstrated, there was no doubt about the diagnosis, for even one such mite is pathognomonic.

Dr. Kenneth Mellanby (1943) describes in detail how a burrow is formed by the tunnelling of a fertilized female mite into and along the horny layer (*stratum corneum*) of the skin, a few millimetres each day, laying eggs and defæcating as she progresses. It is the mite's fæces that account for the dark grey colour of a burrow. Tiny splinters and engrimed scratches can simulate mite burrows, but the course of a burrow is always rather tortuous and irregular. The open end of the burrow is continually being worn away by friction, washing and scratching, so that burrows are rarely seen longer than a centimetre in length. The tunnelling mite is to be found at the closed or advancing end of the burrow, often being visible there as a minute whitish speck, and commonly in close association with a tiny epidermal vesicle.

To extract the mite for identification an ordinary sewing needle is passed into the closed end of the burrow, as if to remove a splinter. A little probing around usually soon locates the mite, which always adheres to the needle as a white speck. This speck can be put on a microscope slide and seen under low or medium power of a microscope. Alternatively, a burrow may be scraped with a small spoon-like curette and the scraping examined after clearing in *Liquor Potassæ*. In this way diagnostic parts of the mite and eggs can be found (for illustrations see Howell, 1950). This latter method is particularly useful in babies, as they will rarely stay still enough to permit use of the needle technique.

Finally, the absence of an apparent source of infection in this case conforms with the experience of Dr. Kenneth Mellanby, who in his delightful book "Human Guinea Pigs" (1945) tells of his experiments on inoculating human volunteers with scabies mites. He showed that during the first month or two of infestation there are no symptoms and no papular rash, but burrows alone are present. At the end of this incubation period the host presumably becomes allergic to the mites and the disseminated itchy rash appears. This conclusive demonstration of a fairly long incubation period, symptomless but infectious, explains how it is possible to contract scabies from an apparently normal person. It also explains why it is generally advisable to treat simultaneously all persons who have been in close contact with a patient, even if they do not itch, so as to prevent reinfection from them during their incubation period. As the patient under discussion went to dances occasionally, it is presumed that he contracted scabies from the hands of a partner who was in the preclinical stage. There was no history of the more usual venereal mode of infection.

CASE II.—An unclean widow, aged thirty-one years, had an itchy rash for six months. She had been told by a pharmacist that she was suffering from scabies and she had accordingly applied sulphur ointment to the itchy areas on and off since the eruption first appeared. Examination revealed an excoriated and impetiginized papular eruption predominating on the sites of predilection of scabies and mite burrows on her hands. Two thorough applications of benzyl benzoate emulsion from chin to soles cured her.

This case is cited because the patient had applied a satisfactory sarcopticide (sulphur ointment) intermittently for six months without curing her scabies. This would tend to discount a diagnosis of scabies until further questioning revealed that she had applied it incorrectly, to the itchy areas only, and not once to the entire body from the chin down. Incomplete self-treatment thus failed to eradicate the infecting mites. Mellanby (1945) tells of children reaching illiterate adulthood, having been excluded from school throughout their childhood because of "chronic scabies" similar to that from which this woman was suffering.

There appeared to be no question of reinfection to account for the chronicity of this woman's scabies as she led a solitary life, and the risk of reinfection from one's clothing and bedding is a very small one, even without disinfesting measures (Mellanby, 1943, 1945; Graham, 1943). However, to make sure of this point, she was advised to boil and iron all her soiled underwear, night attire and bed linen, a precaution that most patients appreciate.

Lastly, it was fortunate that she had not brought upon herself a troublesome sulphur dermatitis. All prescriptions for benzyl benzoate emulsion or sulphur ointment should be marked "Do not repeat", in order to avoid over-treatment if the itching does not cease immediately. Patients should be advised to use plain calamine lotion if the itching persists for a few nights, and it is seldom necessary to repeat the treatment.

CASE III.—A housewife, aged forty-three years, consulted her medical practitioner complaining of mild menopausal symptoms, for which phenobarbitone tablets were prescribed. Two weeks later she returned with a severe itch, occurring mainly at night when she became warm in bed, and accompanied by a mild papular eruption on her trunk and limbs. She had not been in contact with itching persons, and her family was quite normal. A diagnosis of scabies was made on the evidence presented, Turkish bath attendants being blamed as a possible source of infection. A four days' course of sulphur ointment was prescribed and carried out to the letter, but the itchy rash persisted.

This patient's eruption did not predominate at the sites of election for scabies. In particular, her hands and wrists were quite clear of lesions. The phenobarbitone tablets were stopped, an antipruritic zinc oxide lotion was prescribed, and in ten days her rash and symptoms had disappeared.

Nearly a year later she had another attack of an itchy papular eruption. This was traced to phenobarbitone contained in a "tonic" medicine that she had been taking during the previous week and, as before, the rash entirely disappeared after the stopping of this medication; this confirmed the diagnosis of drug rash. She was able to tolerate another barbiturate, "Amytal" (Lilly), with impunity.

This case should not have been diagnosed as scabies on the presence of an atypical itchy eruption, in the absence of burrows or at the very least a history of contact with a case of scabies. The history of her itch being worse at night should not be given any great significance, for many itching skin complaints are similarly most troublesome when the patient is tired and warm in bed. The patient

would have been better managed in the manner of the bachelor (Case I).

This case also illustrates the fact that drugs may well be called "the common imitators" of skin diseases. Syphilis, of course, is still "the great imitator" because of the protean manifestations from a single cause, but drug rashes are nowadays very much commoner. When confronted with any unusual dermatosis make a point of asking yourself: "Is this (i) a drug rash, (ii) syphilis, (iii) tuberculosis, or (iv) artefact?"

CASE IV.—An executive business man, aged sixty-nine years, presented with a disseminated itchy rash, the itch being worst at night, in bed. Ten years previously he had had "eczema" of one ankle region, which had spread to his trunk and other limbs. The intensity of the rash had fluctuated from time to time, never completely disappearing, and despite numerous local remedies always became worse whenever he sweated freely (for example, in summer). No one else in his family had any skin trouble.

Examination revealed a slightly excoriated pink papular and, in parts, papulo-vesicular eruption on all the typical scabies sites. He did indeed look very much as if he had scabies, but there were no burrows, and examination of vesicle contents obtained by scraping failed to reveal any mites or their eggs.

In this case the diagnosis was difficult. Despite the almost text-book appearance of the lesions and their distribution, there were on the other hand the following features.

1. The atypical course of his history. A scabies rash develops almost simultaneously on all areas, not as an itchy patch on one leg. However, he might have developed scabies recently in addition to an existing chronic dermatosis—a rather risky double diagnosis.

2. The absence of scabies in his family. This would surely exclude scabies of ten years' duration. As the late Dr. E. H. Molesworth (1944) expressed it: "If a regular bedfellow remains free of itching the evidence against scabies is overwhelming." This still does not exclude the possibility, however remote, of scabies engrafted on an unrelated chronic dermatosis.

3. The absence of burrows and demonstrable mites. As was pointed out in Case I, this can sometimes be temporarily misleading in cleanly persons. The logical thing to do was to reexamine him for burrows and mites after a week of using a simple zinc oxide lotion. At the end of the week there were still no burrows or mites found, and his rash still looked like scabies. It was decided to try two applications of benzyl benzoate emulsion as a therapeutic aid to diagnosis. This did not cure him.

After a number of investigations it was concluded that he had a hyperhidrotic dermatitis, and treatment by sedation, weight-reduction, and X-ray therapy produced a well-sustained improvement.

CASE V.—A housewife, aged sixty-six years, presented with a self-diagnosis of "acute scabies". She said that six years previously she had developed an itchy rash in her groins, which had spread to her trunk and thence to her face and neck, where it had persisted. Examination revealed crusted excoriations of her face and neck, the scabs of which she said she could pick off as "black scabies". There were no other skin lesions on her body.

Further examination revealed that she was a "highly strung" type of person, easily upset by minor home problems. Superficial psychotherapy resulted in considerable improvement.

There is no doubt that here was an instance of self-produced excoriations on a basis of a masochistic neurosis.

Except in nursling infants it is very rare to see facial lesions in scabies, and certainly the lesions of scabies are never confined wholly to the face and neck. Yet this woman had been hopefully dabbing benzyl benzoate emulsion on her lesions for some months.

Summary.

Five cases of itching skin diseases are reviewed and their diagnoses are subjected to comment.

It is emphasized that scabies should rarely be diagnosed unless the causative mite or typical burrows can be demonstrated.

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SOME OBSERVATIONS ON THE USE OF HEXAMETHONIUM BROMIDE IN THE TREATMENT OF AMBULANT HYPERTENSIVES.

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SINCE their introduction in 1948 by Paton and Zaimis (1948*a*) the use of the methonium compounds as a method of treating hypertension has had a checkered career, some writers being enthusiastic, others quite antagonistic.

Pharmacologically the most active of these compounds in hypertension are the pentamethonium and hexamethonium halides. There is little to choose between them in their hypotensive activity (Barnet, 1951), and for technical reasons (deliquescence) hexamethonium bromide has been mainly used.

Since their introduction several clinical studies evaluating the drug have appeared (Campbell and Robertson, 1950; Burt and Graham, 1950; Turner, 1950; Smirk and Alstad, 1951; Werko *et alii*, 1951; Turner, 1951; Murphy, 1951; Mackey and Shaw, 1951). All workers are agreed that hexamethonium bromide will cause lowering of blood pressure in nearly every case, especially when given parenterally. To find a hypertensive who shows no response whatsoever is rare. Two such cases have been reported (Freeman, 1950; Locket, 1951). Usually the higher the blood pressure, the greater the response.

The mode of action of these drugs is fully discussed by Paton and Zaimis (1948*b*) and they are in general described as ganglionic blocking agents, affecting the ganglia of both the sympathetic and parasympathetic nervous systems. More accurately speaking, they diminish synaptic conduction and only in high concentrations constitute a "synaptic blockade".

Although the ætiology of essential hypertension is unknown, it is agreed that peripheral vasoconstriction plays a dominant role. Harrison *et alii*, in their text-book "Principles of Internal Medicine" (1951), make the following statement: "It is therefore inescapable that one important factor, if not the most important factor, in all cases of hypertension is a high level of vasomotor tone."

Site of Action.

The part of the vascular bed most affected by these drugs is still the subject of investigation. Arnold, Goetz and Rosenheim (1949), using a Goetz digital plethysmograph, detected increased peripheral blood flow after administration of the drugs. However, Shackleton (1951), while using hexamethonium bromide during surgery to reduce shock, found less bleeding from operation sites, which he considered as suggesting that the splanchnic vessels were predominantly affected. Some relaxation of venous tone also appears to take place (Turner, 1950).

An important question in the therapy of hypertension is whether reduction of the blood pressure is desirable. Obviously there are patients showing gross arterial degeneration in whose treatment such a move would be foolish. Many of the accidents reported have been in just such patients, but in most cases one would agree with Smirk (1950*a*): "High blood pressure is not to be regarded as

merely symptomatic but as a means whereby multiple underlying pathological factors lead to the disability characteristic of the disorder."

It has already been shown that hexamethonium bromide causes only temporary lowering of the blood pressure lasting from one to six hours, depending on the method of administration. Perhaps this temporary hypotensive effect is not without benefit, as even intermittent lowering of the blood pressure for periods during the day must surely lessen the strain on the cardio-vascular system. To support this one could cite cases of labile hypertension, such as described by Turner (1951): "A woman of sixty was known to have had a diastolic B.P. in the region of 130 mm. of Hg. for 25 years. In such instances the pressure recorded at rest . . . is usually much lower or even within the normal range." These cases are not uncommon and any drug which will simulate this lability may well be of use and prolong life.

To be clinically useful in hypertension a drug should have the following characteristics: (i) it should be fairly potent in its depressor action; (ii) it should have a long enough action to depress the tension for a reasonable portion of the day; (iii) it should be available in oral form and be reasonably uniformly absorbed; (iv) it should possess a minimum of side effects; (v) it should show little or no tendency to cause development of tolerance; (vi) it should be safe enough to be administered to out-patients.

On examining the properties of hexamethonium bromide in relation to these requirements we find that these drugs are "the most powerful hypotensive agents yet developed" (editorial, *The Lancet*, 1951). So powerful indeed are these agents that many writers give a warning that their initial use should be restricted to hospital in-patients. My own experience of their potency is best illustrated in the case of a male subject, aged fifty-six years, whose average blood pressure was 240 millimetres of mercury, systolic, and 135 millimetres, diastolic. Administration of one tablet of 250 milligrammes of hexamethonium bromide three times a day caused the blood pressure to drop to 130 millimetres of mercury, systolic, and 80 millimetres, diastolic. More usually larger doses of the order of 0·75 to 1·0 gramme three times a day are required to achieve such an effect.

The present series of patients on whom the methonium compounds were tried all received the drug orally while ambulant. In addition, one patient received preliminary doses by injection while resting in bed for several days before commencing oral treatment. Five women and one man were followed for six months. No attempt was made to make a statistical analysis, but close supervision allowed certain conclusions to be drawn from the use of the drugs.

In the selection of patients there were with one exception no major complaints referable to the cardio-vascular system, the hypertension being detected at routine examination for fatigability, nose-bleeding *et cetera*. The desirability of controlling symptomless hypertensives must be the aim of all long-term hypertensive therapy, for insurance statistics inform us that despite the odd patient who "goes on for years", the majority of subjects are candidates for premature death. Therefore it was decided to see how a small group would react to prolonged oral therapy and to see if it was a practical "office" procedure for the control of hypertension. Each patient was ambulant, and the blood pressure was recorded in all except one case by the same observer every two or three days for the early months and thereafter weekly or fortnightly. Owing to the recognized dangers of the drug, an attempt was made to lower the diastolic pressure only to about 105 to 110 millimetres of mercury at the time of the routine visit. That lower pressures were achieved was evident from the occasional occurrence of minor visual dimness, slight postural hypotension and general feelings of fatigue and malaise that were admitted by each patient at one time or another. Some 260 readings were taken on the six patients. Four other patients taking the drug were excluded, as they did not attend regularly enough for their condition to be fully assessable.

One of these latter patients had a very good initial response with three tablets three times a day (that is, 750 milligrammes three times a day); his systolic blood pressure dropped from 270 to 145 millimetres of mercury and his diastolic pressure from 150 to 90 millimetres. His case was especially interesting as his hypertension had recurred after bilateral sympathectomy. Unfortunately he moved away from Sydney.

The patients selected all had diastolic blood pressures of 130 millimetres of mercury or more and had previously been observed for months or in some cases years. The diagnosis in five cases was essential hypertension; the other was an example of renal hypertension. Only one patient was in imminent peril, as judged by physical examination, including investigation of the eye grounds and urinary sediment findings. There was no doubt that this particular patient had pronounced arterial degeneration.

Potency.

The potency of these agents is not disputed. The literature is full of references which testify to the remarkable activity of the methonium compounds in hypertension. They have also proved of value in acute left ventricular failure, and Penny and Shackleton (1951) report the dramatic results in a case of eclampsia, in which the reduction of blood pressure appeared life-saving.

Only one of the group showed no response whatsoever to the drugs. She was a girl, aged sixteen years, with a blood pressure of 210 millimetres of mercury, systolic, and 140 millimetres, diastolic, who failed to respond to even 300 milligrammes of pentamethonium bromide given daily by intramuscular injection, and later to eight grammes of hexamethonium bromide per day given orally. This patient eventually proved to have an aneurysm of a renal artery with an ischæmic kidney—a true example of unilateral renal artery disease causing hypertension. Removal of this kidney produced a dramatic fall in tension; but eight months later the pressure had again started to increase, possibly owing to the severe arteriolar damage in the remaining kidney. This future pattern of events may have been predicted by examination of sections of the removed kidney. The upper two-thirds of the kidney nourished by the blocked artery was atrophic; in the lower pole, supplied by an accessory renal artery which had by-passed the obstruction, were found proliferation of the muscular and intimal coats of the arteries and some fibrinoid degeneration of the afferent arterioles. There were also occasional crescents visible in the glomeruli. Since this was a case of "humoral" hypertension with the pressor agent acting directly on the arteriolar walls, it was quite understandable that no response to the drugs could take place. Strangely enough, side effects of mydriasis, dry mouth and constipation, although present while these large doses were being taken, were not disabling.

The remaining patients all showed an initial responsiveness to the drug given orally, but as time went on increasing amounts merely led to an increase in side effects and a lessening of the effect on the blood pressure. However, despite this acquisition of tolerance, patients often admitted to hypotensive spells at some time during the day, characterized by dimness of vision and a feeling of faintness, even though at their routine blood pressure examination the figures were not particularly lowered. This led me to lower the midday dose and increase the night dose, in the belief that this would lessen the attacks of postural hypotension. My impression was that this was successful. How effective the larger night doses were in reducing the blood pressure I do not know, as I was unable to check the sleeping pressures. The use of the inclined bed with the head raised, as suggested by Smirk (1950*b*), proved too much for the only patient on whom it was tried and it was given up. If these drugs can keep the nocturnal blood pressure well down, they may prove of benefit to hypertensives by reducing the strain on the cardio-vascular system for almost half of the twenty-four hours. A worthwhile investigation would seem to be the measurement of blood pressures of sleeping hypertensives and their comparison with the readings following the administration of hexamethonium bromide before retiring. It must be remembered that sleeping figures of only 110 millimetres of mercury, systolic, in men and 105 millimetres of mercury, systolic, in women constitute abnormal readings (Mueller, quoted by Fishberg, 1939). This suggests that to be successful in procuring efficient nocturnal falls, readings of the order of 90 millimetres of mercury, systolic, and lower should be aimed at.

Dosage.

The dosage used in the treatment of these patients varied from the initial 250 milligrammes three times a day to a maximum of 2·5 grammes every six hours, in the case in which no response was obtained. The usual maximum was more like 1·5 grammes three times a day—that is, six tablets three times a day. Only in one case did the initial dose of 250 milligrammes three times a day produce satisfactory lowering of the blood pressure. Three to four oral doses a day are required, as the drugs have the defect of being limited in the duration of their action.

It must be remembered that the parenteral dosage of the drugs is of the order of one-twentieth of the oral dose.

An interesting observation was the enhancement of the drugs' action that was occasionally noted during times of intercurrent infection.

Absorption.

My experience is that administration of these drugs on an empty stomach leads to many unpleasant reactions with no greater advantage in the depressor effect. However, the irregular absorption with fluctuating antipressor effects is one of the major drawbacks of the oral preparation. On a fixed and apparently satisfactory dosage all the patients have complained at one time or another of unpleasant hypotensive effects, mainly affecting their vision rather than their consciousness.

In one case a vigorous male patient, aged forty-seven years, whose original blood pressure was 230 millimetres of mercury, systolic, and 130 millimetres, diastolic, whilst receiving 750 milligrammes of hexamethonium bromide three times a day developed pain in the chest lasting one and a half hours. The history suggested a coronary infarction, but an electrocardiagram revealed paroxysmal auricular fibrillation only. This cleared up the next day, and the man carried on the course without further mishap.

Another patient, a female, aged thirty-nine years, whose original blood pressure was 210 millimetres of mercury, systolic, and 140 millimetres, diastolic, and who attended rather erratically, complained of several attacks of dimness of vision whilst receiving 1·25 grammes three times a day; her blood pressure at this time was 120 millimetres of mercury, systolic, and 80 millimetres, diastolic. The dosage was reduced to 750 milligrammes three times a day and the patient felt comfortable; her blood pressure was 175 millimetres of mercury, systolic, and 110 millimetres, diastolic. She ran out of tablets, and ten days later, while still without tablets, developed a central vein thrombosis of her left eye. Whether previous hypotensive attacks predisposed her to this is debatable.

The next patient, a female, aged fifty-six years, was a hypertensive cardiac cripple. She was the only one of the group with severe symptoms. Her blood pressure was 260 millimetres of mercury, systolic, and 130 millimetres, diastolic, observed since 1948 with minor variations. She had had a transient cerebral vascular accident in 1947 and was subject to visitations of cardiac asthma every few weeks, necessitating the use of "Digoxin", mersalyl and oxygen by her bed. Her heart was enlarged, and in June, 1950, gallop rhythm was present. On January 4, 1951, she received 0·5 gramme of pentamethonium bromide twice, and thereafter three times a day. By January 11 the blood pressure was 180 millimetres of mercury, systolic, and 90 millimetres, diastolic, on a dose of one gramme three times a day. Surely this was an example of "one of the most dramatic experiences in modern clinical medicine" (Frankel, 1951). This patient literally "threw away her crutches". "Digoxin", mersalyl and oxygen administration was suspended for the first time for two years, and the patient was able to go to town alone. This improvement has not been reflected in her fundi, which over the last year have shown the development of hypertensive changes. Moreover, like the other patients, she has developed a tolerance to the drugs, and increasing doses, though effective, have made her unhappy through ocular discomfort, a dry tongue, a metallic taste, abdominal distension and constipation. Physostigmine drops (Smirk, 1950*c*) have been used in an attempt to relieve her eye symptoms. However, these caused frontal headaches and proved ineffective. A mixture containing pilocarpine was successful in relieving abdominal distension and constipation, one dose per day being sufficient. Despite the development of tolerance to the drugs, this patient has had only two attacks of cardiac asthma since commencing treatment, and now, one year later, she is receiving three and a half tablets (875 milligrammes) three times a day, her blood pressure being about 190 millimetres of mercury, systolic, and 100 millimetres, diastolic. I cannot say, however, that she is very happy, weakness and fatigability being a constant complaint.

Another female patient, aged sixty years, with a blood pressure of 235 millimetres of mercury, systolic, and 130 millimetres, diastolic, had had a retinal hæmorrhage before coming for treatment. This had occurred in January, 1949. Her symptoms were minimal, and treatment was commenced with one tablet of hexamethonium bromide (250 milligrammes) three times a day. This was slowly increased to three tablets three times a day. Faintness and sinking feelings occurred when her blood pressure (at the time of examination) was 170 millimetres of mercury, systolic, and 110 millimetres, diastolic, and a reduction to two and a half tablets three times a day was made. Subsequently she became habituated to this dose, and the blood pressure went back to 200 millimetres of mercury, systolic, and 125 millimetres, diastolic, and an increase was made slowly to four tablets three times a day (that is, one gramme three times a day). This roughly maintained her blood pressure at about 185 or 165 millimetres of mercury, systolic, and 115 or 95 millimetres, diastolic (random readings), for some six months. When she ceased to take the tablets her blood pressure returned to 200 millimetres of mercury, systolic, and 125 millimetres, diastolic, and she complained of flushes.

The next patient also was a female, aged fifty-nine years, who had a blood pressure of 240 millimetres of mercury, systolic, and 130 millimetres, diastolic, observed since November, 1949. Her blood pressure was well maintained around 175 millimetres of mercury, systolic, and 110 millimetres, diastolic, on a dose of two tablets (500 milligrammes) three times a day, and later on a dose of four, three and a half and four tablets per day to achieve a similar reading. Her blood pressure one month after she had ceased to take the tablets was 190 millimetres of mercury, systolic, and 110 millimetres, diastolic.

This maintenance at a lower figure is, I fear, temporary, despite Campbell and Robertson's (1950) original claim that after cessation of therapy the blood pressure often remained down.

Presenting with epistaxis and headaches, the next patient, a female, aged fifty-seven years, had a blood pressure of 220 millimetres of mercury, systolic, and 130 millimetres, diastolic. These figures were reduced to 185 and 160 millimetres of mercury, systolic, and 110 and 105 millimetres, diastolic (random readings), with a dose of three tablets (750 milligrammes) three times a day, but there was a tendency for the pressure to rise despite a continuance of this dose. Any attempt to increase the dose led to attacks of postural hypotension and had to be abandoned. However, she declared that her headaches were relieved while she was receiving treatment, and that they returned when therapy was suspended.

All these cases bear out the point made by Smirk and Alstad (1951): "There has not been sufficient recognition of the tolerance which develops with continued administration of C5 and C6 salts." However, in my experience, attempts to overcome this by increasing the oral dose failed because of side effects and sudden unexplained periods of sensitivity to the drug (or, more likely, fluctuations in absorption).

The oral preparations do not fulfil the ideal requirements of uniform absorption, and this has led Smirk to teach his patients to inject the material subcutaneously like diabetics. Investigations into the question of absorption of oral preparations by Milne and Oleesky (1951) show that between 19% and 30% of the oral dose is recoverable in the fæces, but undoubtedly enough is absorbed to be active, and the action of the drug in impairing the motility of the gut may explain the variations in its absorption.

Side Effects.

The main side effect, as far as we are concerned, is postural hypotension. This is not a necessary evil of all hypotensive drugs, and is present only with large doses of *Veratrum Viride*, another compound with a powerful hypotensive action (Kauntz and Trounce, 1951). However, it is not uncommon with quite moderate doses of hexamethonium. Naturally the incidence of this phenomenon is greater at higher dosage levels. Whether it is necessary to bring the blood pressure down to a range where this will occur frequently is something which has yet to be proved.

I have tried to aim at a diastolic pressure of 105 to 110 millimetres of mercury and have had few serious complaints of this phenomenon. Weakness and fatigability were noticeable features in many cases and increased as the blood pressure fell. A number of patients complained of constipation, dryness of the mouth and ocular discomfort. Occasional bouts of diarrhœa were noted. Abdominal distension and constipation require the regular administration of liquid paraffin. Recently pilocarpine in a dose of one-fifth of a grain has been used with success for the control of these symptoms. This is given as a mixture once a day.

One side effect—namely, anxiety neurosis due to frequent determinations of the blood pressure—was not seen. This was perhaps achieved by the avoidance of comment on the actual reading to the patient, except to give a word of reassurance no matter what the figure.

Safety.

The question of safety is vexed. Many writers have stressed the need for small doses to commence with, in order to eliminate hyperreactors. With this I agree, and I cite the case above of pronounced response to one tablet (250 milligrammes) three times a day. The main dangers, apart from hypersensitivity, are overdose with resultant profound lowering of the blood pressure. Several such cases have occurred and usually proved fatal (Hirson and Kelsall, 1951). Adrenaline is not considered an antidote owing to its own ganglionic blocking properties (Burn, 1942). Pituitrin (10 units in 50 millilitres of saline given intravenously) is recommended as a more effective antidote (Burn, 1951).

The other risks of excessive reduction in blood pressure are coronary thrombosis and cerebral thrombosis. Strangely, only the latter appears to have been reported, by Cropper (1951) and by Banton (1951); but their cases seem to have had the hallmark of severe degenerative arterial disease.

Paralytic ileus has figured largely in the literature as a dangerous complication. That it is not related to dose or to degree of hypotension is suggested by Burn and Hosford (1951), who describe a case in which, after receiving one gramme four times a day for ten days, the patient developed ileus some time after administration of the drug was suspended; treatment with pituitrin and a Ryle's tube proved successful.

Brominism has been reported from the use of the bromide salt (Sommerville and Allan, 1951); but it is rare despite the large amounts of the ion absorbed. It was not observed in the case reported above, in which, after large doses given parenterally, eight grammes a day were given by mouth for six days. Salt-poor diets have been recommended to potentiate the effect of the drugs, but are said to accentuate the danger of brominism. It is doubtful whether the added potentiation is of a large enough order to make this risk worth while. Any mental confusion or drowsiness warrants a blood bromide estimation. Figures above 150 milligrammes are suggestive of intoxication. The introduction of the bitartrate salt will eliminate this danger.

Apart from the above-mentioned, no dangerous toxic effects have been reported despite the widespread use of the drugs.

Discussion.

I have followed this group for six months and have used the drugs intermittently on a number of other patients; my impressions are that while they were receiving the maximum tolerated doses the blood pressure was on the average slightly but definitely lower than before treatment (a typical example would be a reduction from 250 to 170 millimetres of mercury, systolic, and from 130 to 110 millimetres, diastolic). Moreover, in each case there were times during the day when the pressure was lower than at the time of examination. This was evident from the patient's description of hypotensive spells.

Whether one is justified in using these drugs for such a small improvement in the average blood pressure is doubtful, and the question would have to be investigated over a very long period. At the moment one would say that it was worth a trial, as there are odd patients who seem sensitive, and good falls in pressure may be obtained. After a short trial period these subjects can be detected; otherwise the therapy should be abandoned.

Summary and Conclusions.

The role of the methonium drugs in hypertension is reviewed and their site of action is briefly discussed. A suggestion is made that intermittent lowering of the blood pressure may be of value by simulating the so-called labile cases of hypertension.

Several points are suggested by which these drugs may be judged, and on the basis of six months' trials on six patients certain observations are made in which the desirable qualities of a drug for use in hypertension and the actual performance by the methonium compounds when given orally are compared. When possible I have quoted from the broader experience of others who have had experience with these drugs.

My own impression of these oral compounds is that they are very imperfect because of the defects mentioned above. On the other hand, when it is necessary and practical to go to the lengths prescribed by Smirk and Murphy in their respective papers—namely, frequent injections of these drugs in increasing quantities—a method of lowering high blood pressure is available to anyone who is prepared to become acquainted with the necessary difficulties of the method. Not many will be induced to try it, and many would prefer to sit back and see what our organic chemists are going to do to "tame" these very potent but unruly drugs.

Acknowledgements.

I am indebted to May and Baker (Australia) Proprietary, Limited, for their generous supply of pentamethonium and hexamethonium bromide. I would also like to thank Miss M. Rolleston, of the library of the New South Wales Branch of the British Medical Association, for her help with the references.

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Reports of Cases.

ACUTE DUODENAL OBSTRUCTION DUE TO AN INTRAMURAL HÆMATOMA.

By DAVID L. DEY,
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ACUTE duodenal obstruction, apart from that associated with congenital abnormalities, is rare. This appears to be a function of the relatively fixed and protected position of the viscus in the retroperitoneum. A search of the available literature has uncovered only one recorded case in which the obstructing agent was an intramural hæmatoma (Oppenheimer, 1933), and in this patient was found, at post-mortem examination, an adenocarcinoma of the head of the pancreas infiltrating the duodenum in relation to the hæmorrhage. It is therefore of some little interest that two instances of this condition have been observed in this hospital within a period of months. The first patient, under the care of Dr. M. Sofer Schreiber, had a clear-cut history of associated epigastric trauma; but in the second case (the subject of this report) the condition apparently arose spontaneously. The possibility of trauma was denied by both the child and her parents, even on the closest questioning.

Clinical Record.

I.N., a previously healthy girl, aged six and a half years, had been suffering from attacks of severe abdominal pain for two days before her admission to hospital on September 6, 1951. This pain began suddenly, and had occurred in intermittent fashion every half-hour or so, accompanied by vomiting during the first day. By the second day the pain was continuous in her epigastrium, with an "overlay" of colic at frequent intervals, and she was vomiting copiously. In fact, the vomiting of 14 ounces of material was recorded soon after her admission to hospital; this vomitus was bile-stained. She had suffered a single day's pain with vomiting some weeks before, of which few details were available.

The child was slightly dehydrated, but her general condition was good and she was alert and cooperative. Her abdomen was completely scaphoid, and there could be seen a mass just to the right of the umbilicus. On palpation this was found to be hard, smooth in contour, and tender, and of the same width as the *rectus abdominis* muscle overlying it. It extended up deep to the liver, and was movable on the deep structures. Peristalsis was audible in the epigastric area. There was no rigidity and little guarding.

On these findings a diagnosis of high intestinal obstruction was made, and the patient was prepared for operation. No opinion was formed as to the nature of the mass.

A right paramedian incision over the mass displayed a completely collapsed small bowel, and hæmorrhage into the retroperitoneum and the hepatic flexure of the colon. The latter was mobilized, and a tense cyst filled with blood clot was found. Further dissection showed this to be in the anterior wall of the lower portion of the first part, and the second part of the duodenum. About two ounces of clot were evacuated, apparently from the outer muscle layers, and the parts were restored to their normal situation. The abdomen was closed without drainage.

Convalescence was uneventful, the child being discharged from hospital on September 17. A subsequent barium meal examination revealed no discoverable abnormality. On September 14 a blood count showed no abnormal features; there was no thrombocytopenia, the clotting time was seven minutes, and the bleeding time was fifteen seconds. The patient has remained well since her return home.

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Reviews.

HUMAN KINETICS.

IN this present age athletic records last for a few years only. The gain of an extra fraction of an inch in height or length or of a fraction of a second in time means progressive attention to minute details of position and movement which formerly would have been ignored. In his book "Human Kinetics and Analysing Body Movements"[1] T. McClurg Anderson, who is principal of the Scottish Physiotherapy Hospital and School in Glasgow, makes an attempt to analyse advantageous components of the leading movements which take place in sport. The author has given prolonged study to this task and has obviously had some athletic experience himself, and no doubt athletes and their trainers will benefit by this detailed exposition. Attention is also paid to those body movements which can be made easier, with avoidance of undue effort and needless fatigue in industry. These are described in the chapter on handling heavy barrels. The author does not display medical knowledge and misses a few factors such as elevated body temperature and the thickness of the lymph layer between blood capillaries and the contractile tissue. His explanation of Dupuytren's contracture will hardly be accepted by the profession. However, the book is not addressed to medical men and deals to a very small extent with medical problems; its value lies, as has been said, with the needs of athletes and trainers of athletes and, in some measure, with industrialists, and to these we can leave appreciation and criticism of a quite interesting volume. The illustrations are admirable. There is an index but no bibliography.

SURGERY OF THE STOMACH AND DUODENUM.

"SURGERY OF THE STOMACH AND DUODENUM", by Claude E. Welch, is a handbook of operative surgery depicting the technical details of the most common and important operations performed on the stomach and duodenum.[2]

The details are based on operative procedures currently in use in the Massachusetts General Hospital "where on the ward service the major part of the surgery must be performed by the resident staff". Herein lies the main value of the book, for the excellent diagrams and the short concise

[1] "Human Kinetics and Analysing Body Movements", by T. McClurg Anderson, F.F.Ph.; 1951. London: William Heinemann (Medical Books), Limited. 9" × 6", pp. 298, with 238 text figures. Price: 30s.

[2] "Surgery of the Stomach and Duodenum", by Claude E. Welch, M.D.; 1951. Chicago: The Year Book Publishers, Incorporated. 8½" × 6", pp. 350, with 79 illustrations. Price: $8.50.

text shows the details of suture material, suturing technique and execution of many operative manœuvres and procedures, in a handy reference form for the younger surgeon.

Provided the younger surgeon uses the book as a handbook of reference for certain details of technique, it will find a useful place in surgical literature. If, however, the clarity of the diagrams and the precise details of technique encourage him to undertake major procedures bereft of a knowledge of pre-operative and post-operative management, and the handling of certain operative difficulties which can be learned only during apprenticeship in the wards and in the operating theatre, he will be more likely to develop a gastric neurosis than become a competent gastric surgeon.

A feature of this book is the standard of the illustrations. The clear and accurate portrayal of the steps in the various operations allows a wide field to be covered in a concise and small volume. The high standard of the publication maintains the clarity of the artist's drawings and correlates the descriptive details in a most compact manner.

The author is conscious of the limitations imposed in producing a handbook of operative surgery. Provided the book is used with discretion, it will be found to contain a lot of useful information presented concisely and yet in considerable detail, and it will be a useful practical guide, especially to the younger surgeon, and those who occasionally have the emergencies of gastric surgery forced upon them. We would also recommend it to the recent graduate with surgical leanings, in his search to find information on the details of surgical technique.

OPHTHALMOLOGY.

A new work, "Ophthalmology", has been produced by Professor Arno E. Town, of the Jefferson Medical College of Philadelphia, and eleven contributors.[1] In the short preface we read: "With all our varied instruments of precision, useful as they are, nothing can replace the watchful eye, the alert ear, the tactful finger, and the logical mind which correlates the facts obtained through all these avenues of information, and so reaches an exact diagnosis." These words, which come from Dr. W. W. Keen, could not have been reproduced at a more opportune time when increased reliance is being placed on ancillary methods and powers of deduction are allowed to atrophy. This work comprises 500 pages of text and is intended for medical students and general practitioners. It is well illustrated with 208 black and white drawings and photographs and with four coloured plates. The whole field of ophthalmology is well covered and many references are given. Australian work in ophthalmology is almost entirely overlooked. This volume is a fine production and is to be commended. Its high price will probably restrict its sales.

A YEAR BOOK OF DRUG THERAPY.

LIKE its predecessors, "The 1951 Year Book of Drug Therapy" is very much more than a résumé of the latest fashions in treatment.[2] A certain amount of experimental pharmacology is included, and a substantial proportion of clinical reports abstracted relate to unsuccessful or equivocal results of the use of particular drugs. Brief but always pointed editorial comment aids in keeping the picture in perspective. The main subdivisions of the volume are devoted to allergy, cardio-vascular disease, dermatology, endocrinology, gastro-enterology, hæmatology, internal medicine, neuropsychiatry, obstetrics and gynæcology, ophthalmology, oto-rhino-laryngology, pædiatrics, pulmonary hæmorrhage, röntgenology, surgical specialties and venereal diseases. Cardio-vascular diseases are considered under the headings of arrhythmias, cerebral vascular episodes, congestive heart failure, coronary disease, endocarditis, hypertension, peripheral vascular disturbances, and thrombosis and embolism; selection from the vast literature on these subjects seems to have been made with discretion. The largest subdivision, that on internal medicine, has sections on *diabetes mellitus*, infectious diseases (bacterial, helminthic, mycotic, protozoal, rickettsial, viral), liver disease, neoplastic diseases, nephrosis, obesity, pain, poisoning, rheumatic disorders and thyroid disturbances. Perhaps the most important material relates to the antibiotics. The editor has, under the heading of infectious disease (bacterial), dealt separately with each of the main antibiotics as well as with certain other important drugs (PAS, "Promizole", sulphonamides, sulphones, thiosemicarbazones); this enables the reader to gain a general picture of the drug and its properties, which is much to be preferred to isolated glimpses of particular instances of its use. Perusal of the accounts of the antibiotics, in particular, will help to give a balanced impression of the limitations and qualifications of their use, as well as of their great value when rightly prescribed. The antibiotics also figure largely in other sections, notably those on ophthalmology, surgical specialties and venereal diseases. Readers of this particular Year Book will probably gain more from reading, or at any rate perusing, it as a whole than from just dipping into it according to their own fancies.

MALNUTRITION.

THE title page of "Perspectives in Human Malnutrition" by Joseph and Theodore Gillman describes the work as "A Contribution to the Biology of Disease from a Clinical and Pathological Study of Chronic Malnutrition and Pellagra in the African", and perusal of the book leaves no doubt that the authors have made a very big contribution.[1]

Pellagra is often chiefly of academic interest to the clinician in temperate climates and particularly with a white population which is reasonably well fed; but a study of pellagra in the African has been shown to be of the utmost importance to an understanding not only of that disease but also of the effects of malnutrition in any population. The concept of disease of organs as an adequate explanation of the clinical syndrome must give way to one which considers the "changing pattern of organization from the moment of its inception until it has reached the other end of its life-track". Regulations of the organism for its survival under different conditions in its environment and for its development are considered to be in different categories; but both forms of regulation must be capable of adaptation to the needs of the organism and reactions will vary with its state at the time—its stage of development, metabolism, diet, external environment, infection, work *et cetera*. The effects of any particular noxious agent will be much greater if they are produced at an early stage of development than if they occur later in life and the wide variations in the manifestations of pellagra are shown to be in large measure due to the age of the patient as well as to the preceding state of nutrition and to the occurrence of acute episodes in a person suffering from long-standing malnutrition. The inadequate and unsatisfactory results of so-called specific vitamin therapy are explicable on this basis, and explanation of the harmful effects which may result from too liberal a diet in a chronically malnourished individual may be found from a study of the pathology of malnutrition.

Unfortunately there is a tendency to prolixity in the discussion of the biology of disease and repetition becomes tiresome; but it is essential that detailed analysis of the factors in the environment should receive the attention which it does receive even at the expense of hard reading. The clinical features of the lesions of the skin, the histopathology of the skin in pellagra and of hyperkeratosis, pigmentation and dyssebacia in malnutrition are admirably portrayed with large numbers of plates. Reactions of the alimentary tract in malnutrition are described in detail, but the most fascinating section of the study is that dealing with the liver. The histopathology of the liver is beautifully depicted and the discussion of the fatty liver, cytosiderosis, hepatic cirrhosis, hæmochromatosis, and the metabolism of protein, fat and carbohydrate in malnutrition and in pellagra is worthy of detailed study by all students and practitioners of internal medicine. The fatty liver in malnutrition is stated to be an incident occurring before and during the acute episode which causes the patient to come to hospital, and the resolution of fat may begin spontaneously with greater or lesser rapidity. It has been shown to occur with or without the presence of cytosiderosis, and when severe fatty accumulation occurs with almost all cells filled with

[1] "Ophthalmology", by Arno E. Town, M.D.; 1951. Philadelphia: Lea and Febiger. Sydney: Angus and Robertson, Limited. 9¼" × 6¼", pp. 512, with 208 illustrations and four coloured plates. Price: £5 7s. 6d.

[2] "The 1951 Year Book of Drug Therapy (September, 1950-August, 1951)", edited by Harry Beckman, M.D.; 1951. Chicago: The Year Book Publishers, Incorporated. 8" × 5¼", pp. 502, with 91 illustrations. Price: $5.00.

[1] "Perspectives in Human Malnutrition: A Contribution to the Biology of Disease from a Clinical and Pathological Study of Chronic Malnutrition and Pellagra in the African", by Joseph Gillman, D.Sc., M.B., B.Ch., and Theodore Gillman, M.Sc., M.B., B.Ch.; 1951. New York: Grune and Stratton, Incorporated. 10¼" × 7", pp. 606, with 259 illustrations. Price: $18.00.

a large globule and up to 40% of fat in the liver, the prognosis is extremely grave and the mortality rate can be 100% despite all forms of therapy. Evidence is submitted that the excessive amounts of iron in adult pellagrins come from the diet owing to alteration in the blockade in the gut against the entry of iron and that the presence of iron pigment in the liver is indicative of altered intracellular metabolism, the result of malnutrition. It can culminate in severe cytosiderosis, pancreatic disorder being in part responsible, and hepatic fibrosis and hæmochromatosis may result, there being every grade between a mildly pigmented fibrotic liver and one which is heavily pigmented and fibrotic.

Hæmatopoiesis, plasma proteins, œdema, the reactions of the bones, the endocrine glands and the nervous system in malnutrition all receive adequate consideration, and a scheme for the prevention and elimination of malnutrition is proposed.

Reference is greatly assisted by a detailed, paged list of contents for each chapter, and by a very full bibliography and indices of authors and of contents; and the production is admirably printed with ample illustrations, tables and charts.

THE SIGNIFICANCE OF HEREDITY IN OPHTHALMOLOGY.

ELEVEN THOUSAND AND SIX private cases, 195 blind pensioners and 24 children attending the Sight Saving School in Hobart provided the material for a survey of hereditary diseases of the eye in Tasmania by J. Bruce Hamilton. As a result of this survey the pedigrees of eighteen diseases of the eye arranged in alphabetical order from "angioid streaks" to "strabismus" are presented in "The Significance of Heredity in Ophthalmology" with sufficient wealth of detail to arouse the curiosity of the geneticist.[1] For the study of refractive errors alone the author reviewed 9980 cases, in 7040 of which refractive errors were found. Of these, Hamilton was able to include 1020 in his pedigrees. He gives no definition of what he considers to be a refractive error, a small matter in view of the mass of material presented.

The pedigrees of retinal detachment pay tribute to Dr. Hamilton's tenacity of purpose in his search for clues. Whether retinal detachment is a disease *"sui generis"* is of minor importance; the pedigrees are there to demonstrate the hereditary nature of the condition.

As a simple remedy for the prevention of hereditary disease, the introduction of sterilization, voluntary or compulsory, is advocated. With the "welfare State" just around the corner, this may present no insuperable difficulty, but whether it would be effective is debatable. Meanwhile, the ophthalmologists of Tasmania are giving a lead to their colleagues on the mainland in the adequate supervision of those unfortunates afflicted with the "malady of myopia" by providing "sight-saving" classes and by the use of other "dioptre-saving" measures.

Notes on Books, Current Journals and New Appliances.

"FAMILY DOCTOR."

THE May issue of "Family Doctor", the British Medical Association's popular monthly journal, presents varied fare for its readers. Subjects of main articles include having an operation, the patient's part in providing his doctor with a helpful history, school in children's hospitals, the Red Cross, the sense of smell, and Sir Godfrey Huggins, the doctor who became a prime minister. Many other subjects are dealt with competently either at length or in brief. Throughout, the presentation of sound material in an entertaining fashion is admirable, and the many illustrations and imaginative layout make the journal most attractive. It is well worth the modest annual subscription of twenty shillings (sterling) including postage, and would be an asset in any doctor's waiting room.

[1] "The Significance of Heredity in Ophthalmology: A Tasmanian Survey", by J. Bruce Hamilton, M.D., Ch.M. (Sydney), D.O. (Oxford), D.O.M.S. (London), F.R.A.C.S.; 1951. Melbourne: A. H. Massina and Company Proprietary, Limited. 9½" × 7½", pp. 162, with 111 pedigrees. Price: 50s.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"The Life and Work of Astley Cooper", by R. C. Brock, M.S., F.R.C.S., F.A.C.S.; 1952. Edinburgh and London: E. and S. Livingstone, Limited. 9" × 6½", pp. 184, with 19 illustrations. Price: 20s.

An attempt at a modern presentation of Astley Cooper's life and work and assessment of the value of his contributions.

"International Health Organizations and Their Work", by Neville M. Goodman, M.A., M.D. (Camb.), F.R.C.P. (London), D.P.H. (London Univ.), with a foreword by Sir W. Wilson Jameson, G.B.E., K.C.B., M.D., F.R.C.P., D.P.H.; 1952. London: J. and A. Churchill, Limited. 9½" × 6½", pp. 338, with 53 illustrations. Price: 35s.

Traces the attempts of governments over the last hundred years to reach agreement on health problems.

"Psychiatry in General Practice", by C. A. H. Watts, M.D. (Durh.), D.Obst., R.C.O.G., and B. M. Watts, M.B., B.S. (Durh.), with a foreword by J. D. Wyndham Pearce, M.D., F.R.C.P.E., D.P.M.; 1952. London: J. and A. Churchill, Limited. 8½" × 5½", pp. 236. Price: 12s. 6d.

Written by general practitioners, the book is intended to be "an introduction to psychiatry in general practice".

"Management of the Newborn", by Arthur Hawley Parmelee, M.D.; 1952. Chicago: The Year Book Publishers, Incorporated. 8½" × 6", pp. 358, with 47 illustrations. Price: $7.00.

One of "The General Practice Manuals".

"The Pathogenesis of Tuberculosis", by Arnold R. Rich, M.D.; Second Edition; 1951. Oxford: Blackwell Scientific Publications. 10" × 6½", pp. 1056, with 89 illustrations. Price: 107s. 6d.

The first edition was published in 1944.

"Atlas of Tumor Pathology (Section II—Fascicle 6): Tumors of the Peripheral Nervous System", by Arthur Purdy Stout, M.D.; 1949. Washington: Armed Forces Institute of Pathology. 10½" × 8½", pp. 58, with 56 illustrations. Price: 60 cents.

Prepared under the auspices of the Subcommittee on Oncology of the Committee on Pathology of the National Research Council.

"Atlas of Tumor Pathology (Section IV—Fascicle 16): Tumors of the Carotid Body and Related Structures (Chemoreceptor System)", by Philip M. LeCompte, M.D.; 1951. Washington: Armed Forces Institute of Pathology. 10" × 8½", pp. 40, with 23 illustrations. Price: 45 cents.

Prepared under the auspices of the Subcommittee on Oncology of the Committee on Pathology of the National Research Council.

"Lung Abscess", by R. C. Brock, M.S., F.R.C.S., F.A.C.S.; 1952. Oxford: Blackwell Scientific Publications. 10" × 7½", pp. 204, with 60 illustrations. Price: 35s.

Based on a series of essays which appeared in *Guy's Hospital Reports* between 1945 and 1948.

"Central Council for Health Education: Information Digest"; 1952. London: The Central Council for Health Education. 10½" × 8½", pp. 50. Price: 1s. 6d.

Contains short statistical articles on twelve subjects ranging from infant mortality and child health to accidents, tuberculosis, rheumatism and cancer.

"Soviet Health Service", by Vladimir Koltsov; 1952. London: "Soviet News." 7½" × 5", pp. 40, with eight illustrations. Price: 2d.

Consists of ten short chapters on different aspects of health service in the Soviet including one on the achievements of Soviet medicine and one on medical education.

The Medical Journal of Australia

SATURDAY, MAY 24, 1952.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: surname of author, initials of author, year, full title of article, name of journal without abbreviation, volume, number of first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE LATE RESULTS OF OPERATION ON THE INTERVERTEBRAL DISK.

EVER since Mixter and Barr directed the attention of the medical profession to rupture of the intervertebral disk involving the spinal canal, many reports have been made on cases in which surgical operation was undertaken for this condition. Considerable difference of opinion in regard to both diagnosis and therapy has been expressed. In October, 1947, we drew attention in these columns to the report of a symposium conducted by the American Orthopædic Association "to determine, if possible, the points upon which there was general agreement, and to explore the possibility of resolving differences in diagnostic approach and therapy". This symposium had been held in April of that year. It was pointed out on that occasion that the term "herniated *nucleus pulposus*", formerly widely used, tended to suggest an over-simplification of the condition. It was becoming increasingly appreciated, not only that the protrusion of a portion of the nucleus and compression of a nerve root were not the whole problem, but that intervertebral disk disease of clinical and pathological significance might be present without protrusion. In derangement of the disk a dual problem had to be considered, firstly a disorder of spinal mechanics, and secondly the effects of spinal nerve compression and irritation. Clearly these effects have to be borne in mind when symptomatology and treatment are being considered. The latest contribution to this subject is the report of a study of the results from disk operations, which comes from the pen of A. L. Eyre-Brook, of Bristol.[1] The author had a series of 123 consecutive cases, and only six of the patients could not be traced, so that he has investigated the conditions of 117 persons. The minimum period of the follow-up was one year. In an interesting discussion on the pathology of the condition, Eyre-Brook states that the lesion of the intervertebral disk has become involved in a speculative pathology which is becoming very popular. The speculation is expressed in the term "slipped disk". He states that the "slipped disk" is endowed with the property of slipping in and out, and the manipulators who support this view contend that they slip the disk back into position at frequent intervals. There is, he avers, not a shred of evidence in support of this theory. Most support for any view of the pathology can be found in the operative findings in cases of disk lesions, but the clinical picture and the myelogram must also be explained in any correct view of the pathology. The true pathology of the condition is primarily a change in the disk consistency, and must have taken place prior to the onset of symptoms. The change converts a normal disk, which has both form and a powerful elasticity, into a shapeless mass of inelastic fibres contained between the vertebræ above and below, and the surrounding ligamentous structures. "A normal disk is like a rubber shock-absorber, while the material of a prolapsed or herniated disk approaches the consistency of perished rubber." Weight-bearing affects the disk of altered texture, so that it will prolapse or herniate through any weak spot. The early phases of these prolapses appear to be associated with backache, but later sciatica dominates the clinical picture. Eyre-Brook asks how the sciatic pain comes to subside when it is caused by the tension in a nerve root passing over a prolapse. He sees three possible explanations. The first is that the nerve root stretches; the second is that the herniated contents are extruded by rupture of the enclosing fibrous layers; the third is that an alteration takes place in the relationship of the nerve root to the prolapse, so that the nerve obtains a shorter course over or around the projecting mass. The last explanation is not possible in the presence of adhesions. Eyre-Brook points out that disk prolapse has been shown to persist in patients who have obtained relief from their sciatica by non-operative measures—the disk prolapse in such cases has still been visualized in the myelogram. Again, partial or complete extrusion is found at operation. With complete extrusion the hernia collapses and the nerve root is released from tension. Eyre-Brook thinks that the termination of an attack of sciatica by one of the three mechanisms which he mentions can be encouraged by rest or by manipulation, the former being the wiser course to follow, with nerve stretching, which occurs more safely without any suddenness or violence. Extrusion may be slow and almost spontaneous, and is more safely encouraged by rest. In his series of cases, only a few patients who were acutely ill were subjected to surgery without first being treated by rest. Only when this failed was surgical operation undertaken. Treatment by rest took one of several forms: (*a*) the spending of three weeks in bed; (*b*) the wearing of a plaster jacket for six weeks; (*c*) the wearing of a surgical corset for an indefinite period. The operation performed in all cases consisted of a simple exposure of the prolapse and the removal of all degenerate material which could be reached by the diligent use of pituitary alligator forceps. Occasionally, when symptoms and signs suggested a central prolapse, a complete laminectomy was performed.

In the 117 cases in the series, disk prolapse was confirmed at operation in 99, an intradural tumour (xanthoma) was found in one case, adhesions only were found in six, and no abnormality was found in 11 instances. Eyre-Brook's findings on the radiological side are interesting. The radiological appearances were confirmed in 41% of cases; no confirmation was obtained in 47%; and the findings were misleading in 12%. In two of the three

[1] *The British Journal of Surgery*, January, 1952.

cases in which the grossest radiological changes revealed a prolapsed disk at a wrong level, radiological appearances were normal at the level of the prolapse. He concludes that little positive help can be expected from the radiograph, save in the important direction of excluding other pathological appearances. In seven cases, complications supervened after operation, but four patients made complete recoveries. We do not propose to give details of Eyre-Brook's findings at operation, nor to describe the levels at which lesions were found; the original paper must be consulted for this. Only six patients stated that they had not benefited from the operation. Eighteen of 24 heavy workers returned to their former occupations and appeared to have made a complete recovery. Residual symptoms and cramps at night were complained of by a number of patients who were otherwise free of pain. An analysis was made of 11 cases in which no abnormality was found at operation. Only one patient recovered completely after the purely exploratory operation; the others retained their complaints wholly or in part. In none of these instances has the subsequent history so far revealed the cause of the sciatica.

The results set out by Eyre-Brook may be compared with those described by Douglas Miller and E. Vanderfeld in this journal in the issue of August 20, 1949. These authors reported on the condition of 125 civilian patients who had been operated on for intervertebral disk sciatica; 108 replies were received. Ninety-seven of the patients who replied had returned to their former occupations; 54 of these were completely free of symptoms, and 43 had insignificant residual or recurrent symptoms. Ten patients were unable to return to their former work, and three were unable to do any work at all. It should be noted that in Eyre-Brook's operations, as in those reported by Miller and Vanderfeld, no spinal fusion was carried out. At the symposium which has been mentioned, some speakers were strongly in favour of spinal fusion. One surgeon went so far as to state that no patient who had had a ruptured intervertebral disk removed could have a mechanically and anatomically normal spine, and that at least half of the patients who had had such an operation performed without fusion of the spine suffered some degree of weakness or pain in the back. It was stated in 1947 that unanimity had not been reached on methods of diagnosis and treatment, and this probably holds today. At the same time, such communications as those of Eyre-Brook and of Miller and Vanderfeld show that if the surgeon chooses to hasten slowly, he may achieve useful results in a large number of cases without undertaking unnecessarily extensive operative procedures.

Current Comment.

GASTRIC MUCOPROTEIN AND CASTLE'S INTRINSIC FACTOR.

SOME twenty-three years ago Castle and his associates announced a discovery of major importance in the physiology of the stomach and of blood building and in the science of nutrition, namely, that the hæmatopoietic principle arises from the interaction of an extrinsic factor in the food and an intrinsic gastric factor. When vitamin B_{12} was discovered and investigated it became clear that this accessory substance was identical with, or at least indistinguishable from, the extrinsic food factor. But the nature of the intrinsic factor and the method of its action remained unknown. Many attempts were made to separate gastric content and extracts of gastric mucosa into discrete components and test each of these for specific action on B_{12}, but success was lacking. Now G. B. J. Glass, of the New York Medical College, and three collaborators have published an important preliminary communication showing that the intrinsic factor is probably what they call "glandular mucoprotein", that is, the substance secreted by the mucoid cells of the neck of the gastric glands.[1] This substance is easily separated from other mucous material in the human stomach such as the slimy protective coating, really surface epithelium mucus, and the degradation product of this, gastric mucoproteose. The four American investigators give a series of properties common to glandular mucoprotein and the intrinsic factor, and certainly the congruity is remarkable. Both are non-dialyzable compounds containing a protein moiety; they are filtrable through a Berkefeld filter, are precipitated by 60% to 80% alcohol or acetone, are salted out by saturated ammonium sulphate, but are not precipitated by 10% trichloracetic acid, and in this last-mentioned property there has been found a valuable method for extraction and purification. Both are found in the normal human stomach and are not necessarily absent when hydrochloric acid is low in concentration. This mucoprotein cannot be detected in saliva, bile or duodenal secretion which does not contain the intrinsic factor; it is found in the fundus and corpus of human stomachs which are the sites of formation of the intrinsic factor. In pernicious anæmia, it may be mentioned, the most severe atrophic lesions are found in the same regions, and in this disease glandular mucoprotein cannot be found in any portion of the stomach. Most important of all were experiments on the treatment of pernicious anæmia. Vitamin B_{12} when administered with glandular mucoprotein led to an improvement much greater than if B_{12} alone was given. Chemical and physico-chemical methods showed that this mucoprotein is a homogeneous substance. The authors with commendable candour admit that they have not established full identity, for, as they state, there may be some substance, such as an enzyme, which is adsorbed by the mucoprotein and which is responsible for the intrinsic factor action. The further experiments which they promise will be awaited with interest.

SPINAL PUMPING IN THE TREATMENT OF ARTHRITIS.

THOSE who remember therapeutic curiosities will recall the apparently strange method of "spinal pumping" which was first conceived in Russia, and was described in a translation published in 1936 of a book entitled "A Basis for the Theory of Medicine", written by A. D. Speranski. An article by J. Holden Robbins and Paul H. Settlage has now appeared giving some of the results claimed from the use of this method.[2] This account really owes its being to the work of the Gillmans in South Africa, and the interest taken in the subject by W. W. Jackson, of Hot Springs, Arkansas, and Clyde Landis, of Chicago. Each of the last two mentioned claims a personal experience of some 300 cases. The stimulus to try this apparently peculiar method seems to have been Speranski's emphasis on the importance of the central nervous system in disease in general, but the Gillmans felt also that there was no evidence that even chronic fibrosis might not be an irreversible state. Full credit must be given for this tenet of faith, which has proved to be of such great importance in the outstanding discovery of cortisone and

[1] G. B. J. Glass, L. J. Boyd, M. A. Rubin and C. S. Svigals, "Relationship of Glandular Mucoprotein from Human Gastric Juice to Castle's Intrinsic Antianemic Factor", *Science*, Volume CXV, February 1, 1952, page 101.

[2] *The American Journal of the Medical Sciences*, December, 1951.

its clinical application to rheumatoid arthritis. Robbins and Settlage recorded the results obtained from the treatment of 70 patients suffering from arthritis, 12 cases classed as acute, the remainder as subacute and chronic. They quote several other authors who have made a trial of this method, which is supposed to excite a vascular reaction on which any therapeutic effect depends. Gillman and Gillman insisted that a systematic study of the patients treated was necessary in adequate assessment of the results obtained, but Robbins and Settlage did not adopt any special diagnostic plan. Instead they took over patients with established diagnoses and evaluated their results by taking a full history, and by careful observation of the patient before and after treatment. Note was made of various activities which the patient was originally able to perform, and he was encouraged to show what he could do later. The technique adopted was as follows. Ten cubic centimetres of cerebro-spinal fluid were withdrawn through a lumbar puncture needle, with the patient in a sitting position, and then slowly reinjected. The cycle took forty-five seconds or more to perform, and was repeated twenty times, the procedure ending with the withdrawal of 10 cubic centimetres of fluid as before. The syringe was connected to the needle by an adapter and tubing, so as to leave the needle undisturbed, and a manometer was included in the circuit. The pressure of spinal fluid was observed in each case, but no correlation could be observed between pressure readings and the clinical results. Six patients felt nausea, and twelve suffered from headache after the procedure, for periods ranging from a few hours to seven days. No lasting ill effects were observed, but in a series of 11 patients treated after the preparation of the appended tables one death occurred fifteen hours after treatment, apparently owing to the formation of a pressure cone in the cerebellum.

The authors find it difficult to sum up their results in a definite verdict, but they feel that additional and more rigorous investigation would be desirable. If any claimed results are due to vascular reactions excited by what amounts to a species of hydraulic manipulation of the lower parts of the central nervous system, it seems fair to expect some experimental evidence of the results of this procedure both in the vascular centres and in the peripheral circulation of the affected parts. There is so much that is speculative in this implied doctrine, and on the other hand there is so much that is empirical in the method, that a cautious critic might surely ask that an attempt be made to provide a firmer basis for a procedure that might be styled an example of remote control, if indeed control is achieved.

TERRAMYCIN AND THE TREATMENT OF PNEUMONIA.

A NUMBER of references have been made in these columns to the promising qualities of terramycin, and in particular to the wide range of its antibacterial activity. Aureomycin, which terramycin closely resembles in antibacterial activity, has achieved wide popularity. Experience with terramycin has been less, and although its defects as well as its advantages are to some extent generally known, much can be learned from an account by G. G. Jackson and five others of clinical and bacteriological experience of terramycin therapy in cases of pneumonia at the Boston City Hospital.[1] One cannot help being struck alike with the favourable and with the unfavourable features of terramycin that are brought out. A series of 91 patients suffering from pneumonia were treated. The bacteriological results and the immediate clinical effects indicated that terramycin was highly effective against pneumococcal pneumonia. In most of the other cases of pneumonia in which a bacterial ætiology was proved or suspected, and in the four cases of primary atypical pneumonia, the immediate effects of terramycin therapy were also favourable. It appeared to be effective against the hæmolytic streptococcus, and to a lesser degree against *Hæmophilus influenzæ*. The potent antipneumococcal effect was shown by the prompt disappearance of pneumococci from the blood in cases of bacteriæmia, their rapid elimination from the sputum in almost all cases, and failure to demonstrate them in pleural fluid obtained after one or more days of terramycin therapy. Fever declined, and symptoms referable to the acute pneumococcal infection began to lessen within the first twenty-four to forty-eight hours after terramycin therapy was started. An important feature, however, was the frequency and rapidity with which pathogenic strains of *Staphylococcus aureus*, almost all highly resistant to terramycin, emerged and replaced the flora of the sputum during treatment with this antibiotic. The purulent character of the sputum, the persistence of staphylococci in such sputum for unusually long periods after the apparent subsidence of the pneumococcal or other primary infection, the recurrence and persistence of leucocytosis and the frequently slow disappearance of signs of pulmonary infiltration, suggest that the staphylococci played an important pathogenic role in maintaining infection in the lung. Terramycin failed to clear these staphylococcal infections, and may have played a significant part in sustaining or aggravating them. Comparable happenings were observed in relation to the gastro-intestinal tract. Gastro-intestinal symptoms during the course of terramycin therapy were frequent and in many cases quite severe. In many of the patients with terramycin-induced diarrhœa, the fæcal flora was replaced by pathogenic staphylococci. Jackson and his colleagues state that the evidence suggests very strongly that these gastro-intestinal infections prolonged significantly the period of morbidity of many of the patients who recovered, and played an important role in the failure of some of the patients to survive. They point out in addition that these untoward results of terramycin therapy have not been limited to patients with pneumonia, according to the reports of other investigators; but on the other hand, the serious effects have not been confined entirely to therapy with terramycin. Jackson and his colleagues consider that comparisons of the results that have been presented with those reported by others are difficult to make and are not justified. They state that it is possible that the doses used were greater, and the duration of treatment longer, than those necessary to produce the desired clinical and bacteriological effects with a minimum of toxicity or of complicating superinfections. The unfavourable features in the present series may also have been due in part to the generally advanced age of many of the patients, and to the large proportion of them who had underlying complications. Other possibly important factors are the increasing incidence of staphylococci as secondary invaders in the hospital, and also the widespread use of penicillin and other antibiotics for prophylaxis and for many minor indications. The laboratory culture measures used were calculated to increase the frequency with which staphylococci would be identified in fæces. It is unfortunate that no parallel series of patients was treated with aureomycin during the same season, and as Jackson and his colleagues point out, comparisons of the results with those from other antibiotics in other clinics are not warranted. The only series with which comparison might be at all valid was a group of patients treated with aureomycin who were studied in a very similar manner during the preceding season. It is stated that both the clinical and bacteriological results appeared to be more favourable, the toxic effects were less serious, and staphylococcal infections did not play an important role in these cases, in which the antibiotic used was aureomycin. This, it is suggested, may be attributable in part to the increasing incidence of antibiotic-resistant strains of staphylococci in the hospital, so that definite conclusions may not be drawn from the comparison. It is important that this matter be satisfactorily investigated, and that terramycin with its many favourable qualities have its exact therapeutic usefulness assessed.

[1] *Annals of Internal Medicine*, December, 1951.

Abstracts from Medical Literature.

OBSTETRICS AND GYNÆCOLOGY.

Prolapse of the Umbilical Cord.

ARNOLD N. FENTON AND D. ANTHONY D'ESOPO (*American Journal of Obstetrics and Gynecology*, July, 1951) record a study of 216 cases of prolapse of the umbilical cord occurring over a twenty-five-year period at Sloane Hospital for Women. They assess the various methods of treatment against the background of fœtal mortality and compare the fœtal mortalities and improvements over five-year intervals. The incidence of prolapse of the cord in this series was 0·35%; the total fœtal mortality rate was 37·5% and the corrected fœtal death rate was 30%. There has been a 25% to 30% improvement in results over the twenty-five year period. The authors discuss abnormal presentations, obstetrical manipulations, multiple pregnancy and cephalo-pelvic disproportion as important predisposing factors. They consider maladaptation of the presenting part to the pelvic inlet the most significant ætiological factor in prolapse of the cord. They did not find fœtal mortality higher in cases of prolapsed cord with the vertex presenting and think that the alleged greater danger of compression of the cord is more than counterbalanced by earlier diagnosis and the tendency to greater dilatation of the cervix, which permits prompt delivery. The level of the presenting part at the time of diagnosis of prolapsed cord was below the level of the spines in two-thirds of the cases, a finding which indicates that delay in making the diagnosis is not uncommon. The incidence of prolapse of the cord was found to increase with the degree of dilatation of the cervix, and the fœtal mortality rate was inversely proportional to the cervical dilatation. The authors found that the fœtal mortality varied from a minimum of 10% when the cord was felt pulsating and the fœtal heart was normal to a maximum of 90% when the cord was not pulsating and the fœtal heart showed distress. Treatment by reposition of the cord was found to be frequently unsuccessful and resulted in a fœtal mortality rate of 48·6%. Rapid delivery after manual dilatation of the cervix with treatment by a Vorhees bag resulted in high fœtal mortality. The authors state that in recent years there has been little alteration in results of treatment by spontaneous delivery, mid-forceps delivery, low forceps delivery and breech extraction. There has been a decline in the use of high forceps, Braxton Hicks's version and the introduction of a Voorhees bag, with a corresponding increase in the use of the Trendelenburg position to elevate the presenting part and Cæsarean section. The authors consider that the degree of dilatation of the cervix is of more prognostic significance than the level of the presenting part. The notable exception to this is the group of patients with an undilated cervix and an unengaged presenting part who were treated by immediate Cæsarean section with advantage over all other methods. Seven Cæsarean sections were performed on this group of patients. All infants were delivered in good condition, and all mothers made uneventful recoveries. The highest fœtal death rates were due to the combined effects of trauma at operative delivery and prematurity of the baby. There were four maternal deaths in the series—two were due to hæmorrhage and shock from torn lower uterine segment, one was due to extensive cervical and vaginal tearing, and one was due to generalized peritonitis following rupture of a lymphogranulomatous rectal stricture. The authors conclude that when the cervix is less than seven centimetres dilated and the infant is not compromised, Cæsarean section is the safest method of delivery. When the fœtus has shown evidence of distress, results are better if the patient is anæsthetized and the presenting part elevated by postural treatment before any type of delivery is attempted. Reposition of the cord, Braxton Hick's version and the use of a Voorhees bag are considered poor substitutes for Cæsarean section when the latter is feasible. The authors stress the importance of careful observation of patients with any abnormal presentation, patients with presenting parts above the pelvic brim after labour has commenced, and patients with multiple pregnancies, in order to anticipate and make early diagnosis of prolapsed cord. They consider it preferable that patients with early rupture of the membranes and a high presenting part should be allowed to be ambulant rather than recumbent.

Vaginal Deliveries following Previous Cæsarean Section.

O'DONEL BROWNE (*The Journal of Obstetrics and Gynæcology of the British Empire*, August, 1951) reviews the results of 100 consecutive vaginal deliveries in women who had been previously delivered by Cæsarean section; 76 had had the lower segment operation. Of the indications for previous Cæsarean section, disproportion, *placenta prævia* and preeclampsia were the commonest, accounting for 49% of the sections. Sixty-three of the patients were allowed to wait a normal onset of labour, and the remaining 37 had labour induced either medically (12 cases) or surgically (25 cases). There was one case of rupture of the uterus in the series of 100 cases. Cæsarean section had been performed elsewhere on account of eclampsia at the thirty-eighth week of pregnancy. The uterus ruptured during labour, and the patient presented obvious signs and symptoms of this condition. The patient and the baby did well after immediate Cæsarean section with subtotal hysterectomy. Two stillbirths are recorded in 37 cases of induction, and one neonatal death followed puncture of the membranes for *placenta prævia*. No obvious cause for the stillbirths was found. The forceps delivery incidence for the series of cases was 35%, as compared with the normal incidence of forceps for the hospital of 11%. The average duration of labour was fourteen and a half hours, and the average weight of the babies was six pounds fourteen ounces. Fifty-nine labours ended spontaneously, four babies were born with a breech presentation, 35 patients were delivered by forceps, and one patient (the one with the ruptured uterus) was delivered by section. One patient delivered herself after perforation of the head following death of the fœtus during a labour with moderate disproportion. Previous Cæsarean section had been performed once in ninety cases, twice in eight cases, and three times in two cases. Morbidity during the puerperium was not a feature in these cases. The fœtal deaths numbered 10; eight fœtuses were stillborn and two babies died during the neonatal period. The author considers that these results from a random sample of 100 consecutive deliveries following previous Cæsarean section provide a reassurance that vaginal delivery following Cæsarean section is not an unduly hazardous venture provided that the facilities of an adequate maternity hospital are available throughout labour. He considers, also, that this further strengthens the claims of the lower segment Cæsarean operation as the method of delivery when this is urgently needed.

Vaginal Bleeding during the Last Trimester of Pregnancy.

ROY E. CROWDER, ERVINE S. BILLS AND JOHN B. CLAIRE (*The Western Journal of Surgery, Obstetrics and Gynecology*, November, 1951) outline a plan of conservative treatment of antepartum hæmorrhage and give results of treatment in 50 cases. They remark on the reduction of maternal mortality rate in this condition, but consider that the fœtal mortality rate of 30% to 50% is too high and is due chiefly to premature delivery of the fœtus, often by immediate Cæsarean section. They state that clinically there is no sharp division between the bleeding from low implantation of the placenta and *abruptio placentæ* (accidental hæmorrhage). If vaginal examination becomes necessary and the placental margin cannot be felt, the condition should be diagnosed and treated as minor *abruptio placentæ*. The authors classify degrees of *abruptio placentæ* as major abruptio when the life of the mother or infant or both is at stake; less severe degrees are classified as minor abruptio. Their outline of treatment of all patients with bleeding in the last trimester of pregnancy is as follows. The patient is admitted to hospital immediately and is carefully examined, but no vaginal or rectal examination is performed. Complete bed rest is essential, full investigation of the blood is carried out, and transfusion is performed if indicated. After twenty-four hours' rest it is usually possible to establish a diagnosis by noting the character of the vaginal bleeding and having an X-ray placentogram taken. Bed rest is continued for twenty-four hours after the bleeding has ceased, and the patient is then allowed out of bed for short periods and is discharged after twenty-four hours with instructions to avoid sexual relations, douches and enemas and to report any bleeding immediately. If bleeding continues with the patient on this regime in hospital, a further effort is made to rest the patient, replace blood and not interfere until the patient reaches the thirty-eighth week of pregnancy. If, however, bleeding is alarming, if labour commences, or if there are signs of fœtal distress, further temporizing is dangerous. A careful aseptic vaginal examination is made with all preparations for delivery of the baby by the abdominal route and the vaginal route, and 1000 millilitres of blood are kept ready for transfusion. Vaginal examination aims at establishing the diagnosis between *placenta prævia* and *abruptio*

placentæ, and determining the degree of dilatation of the os, the thickness and extent of the palpable placental margin, and the presentation, position and engagement of the presenting part. Treatment depends on findings at this examination, and although each patient is treated on individual lines the principles of treatment are as follows. The finding of complete *placenta prævia* affords indication for immediate Cæsarean section if the infant is alive. In cases of partial *placenta prævia* and low implantation of the placenta the membranes are ruptured if less than one-half of the os is covered by placenta, the placental margin is thin, the vertex is presenting and the cervix is favourable for induction of labour. In cases of minor abruptio and mild degrees of *placenta prævia* vaginal examination is usually unnecessary, and the membranes are ruptured after labour has commenced. Major *abruptio placentæ* with associated pain, shock and frequently toxæmia demands immediate delivery to save the mother's life. If the os is not dilated and uterine contractions are poor, Cæsarean section is indicated, even though the fœtus is already dead. Such patients are not submitted to operation until resuscitation measures are effectively performed. Of the 50 cases of antepartum hæmorrhage reported, 18 were due to *placenta prævia* and 32 were due to *abruptio placentæ*. Four of the patients with *placenta prævia* were treated by Cæsarean section, as were two with major *abruptio placentæ*. The total fœtal mortality rate for the group was 24%, and the corrected fœtal mortality rate was 17%. There were no maternal deaths. The authors consider that the placenta and its attachment to the uterus is the important factor in relation to fœtal death and not the location of the placenta in the uterine cavity.

Pregnancy following Conservative Operation for Endometriosis.

R. L. HAAS (*Surgery, Gynecology and Obstetrics*, October, 1951) reports a series of 45 patients treated by conservative surgery for endometriosis and evaluated from the standpoint of pregnancies occurring after such operation. Reports on pregnancy after conservative surgery for endometriosis have improved a great deal in the past ten years, and the author considers that the post-operative fertility rate of 40% in the 35 married patients of this series is probably due to earlier operation on patients of a lower age group (28·7 years) with less advanced disease. It is pointed out that statistics such as these do not take into account factors such as no desire for pregnancy after the operation, contraception practised by patients after operation and impaired fertility of husbands. Fourteen of 35 married patients in this group conceived 19 times. There were three spontaneous abortions in the first trimester; eleven patients had a total of 14 pregnancies to term. All pregnancies and labours were uncomplicated with the exception of one. In this complicated case intestinal obstruction developed at the eighth month of pregnancy; treatment was by Cæsarean section and bowel resection. The obstruction was due to adhesion bands after abdominal operation or due to endometriosis in the past. There was no evidence of reactivation of endometriosis at the time of operation. No patient who conceived after operation revealed clinical evidence of recurrence of endometriosis. Since only three of the married patients had conceived prior to operation the increased fertility after operation would appear to be real. The correction of associated retroversion of the uterus or the performance of any measure to improve patency of the Fallopian tubes does not appear to have been a factor of significance in this series of cases. The author agrees with Scott that the relief of dyspareunia may be a factor in the improved fertility of these patients after conservative operation. He suggests that early conservative operation for patients with symptom-producing endometriosis offers the best opportunity for future pregnancy.

Maternal Mortality in Dublin (1940-1950).

KIERAN O'DRISCOLL AND BRIGID QUINN (*The Journal of Obstetrics and Gynæcology of the British Empire*, December, 1951) review the chief causes of maternal mortality in the three Dublin maternity hospitals (Rotunda, Coombe and National Maternity) from January, 1940, to January, 1950. The review is based on 300 deaths at all stages of pregnancy, labour and the puerperium. Out of 92,224 deliveries in the hospitals, 192 deaths (or 64% of all deaths) occurred as a direct result of the following complications: eclampsia 42, sepsis 38, rheumatic heart disease 33, accidental hæmorrhage 32, ruptured uterus 20, post-partum hæmorrhage 20, *placenta prævia* 17, non-convulsive toxæmias 15. The mortality rate associated with eclampsia was 13% (42 deaths in 320 cases) compared with a 10% rate reported by Solomons thirty years previously. The authors conclude that whilst in Dublin the treatment has not improved since Tweedy's day and prevention is very far from satisfactory, the management of preeclampsia is often too conservative, and of eclampsia is not conservative enough. The non-convulsive toxæmias of late pregnancy accounted for 15 deaths, and 10 of these were in known cases of essential hypertension. In only three of the fatal cases were the patients known preeclamptics, and two of these died from infection. Thirty-two women died as a result of accidental hæmorrhage. As only two such cases occurred in association with the large number of toxæmias of late pregnancy treated in hospital, the authors suggest that the association of accidental hæmorrhage with toxæmia is not so close as is supposed, and they favour the theory of fibrinogen deficiency in the mother's blood. Three patients died from post-partum hæmorrhage. Results from operative treatment were bad—15 patients had Cæsarean hysterectomy and seven died, 16 were delivered by Cæsarean section and two died, and of two patients who had a hysterectomy for post-partum hæmorrhage complicating accidental hæmorrhage, both died. *Placenta prævia*, with 17 deaths in 914 (a mortality rate of 1·85%), is a less important cause of death. Eleven of the patients affected were delivered vaginally, and the authors conclude that much of the remaining mortality in this condition results from reluctance to perform Cæsarean section without the likelihood of a surviving infant. Twenty mothers out of 63 died from ruptured uterus. In 15 cases of spontaneous rupture there were eight deaths; no cause was found. Rupture of previous section scar ranked high in the list of causes of ruptured uterus, but the mortality rate was low; in 12 cases only one death occurred. The diagnosis and treatment in all cases was without delay. Rupture of the uterus occurred seven times associated with *placenta prævia*, and four patients died. Failure to establish the diagnosis was the biggest factor in the resultant mortality for rupture of the uterus. Uncomplicated post-partum hæmorrhage as a cause of maternal mortality in hospital is negligible. In 10 uncomplicated cases, four of the patients were delivered in hospital and the remaining six were admitted to hospital with the placenta *in situ*. The authors make a plea for simplicity in teaching and early manual removal of the placenta, without anæsthesia if necessary. Almost all deaths from sepsis followed complicated or assisted deliveries, or delivery of a macerated fœtus. There were only three deaths from infection associated with abortion or miscarriage. The records of the 32 fatal cases of uncomplicated rheumatic heart disease show that the majority of patients died because the lesion was not diagnosed until congestive failure had developed.

Retinal Changes in the Toxæmias of Pregnancy.

R. LANDESMAN, R. G. DOUGLAS AND S. S. SNYDER (*American Journal of Obstetrics and Gynecology*, January, 1952) analyse the retinal changes in pregnant patients with hypertension, renal disease and *diabetes mellitus*. They state that with mild hypertension, early retinal examination provides a basis for comparison with advanced changes which may occur later. In severe hypertensive disease, the progress of the hypertensive toxæmia is reflected as accurately by the behaviour of the retinal arteries as by any other single clinical sign or laboratory test. The presence of increasing localized and generalized spasm is always an ominous sign, and indicates reduced chances of fœtal survival. In 80% of patients with increasing spasm, it was considered necessary to interrupt the pregnancy. In renal disease, the retinal observations do not indicate the extent of renal damage; however, as retinal arteriolar abnormalities become more advanced, the prognosis for fœtal survival is reduced. In *diabetes mellitus* with associated pregnancy toxæmia, retinal vascular changes are a more ominous prognostic sign to the fœtus than in toxæmia alone. Increasing retinopathy in these patients usually indicates death of the fœtus, unless early intervention is performed. Diabetic retinopathy is a further hazard to the vision of the mother; it tends to increase during pregnancy and may seriously involve the macular area. Patients with these findings should not attempt pregnancy. The authors conclude that frequent examination of the retinal bed is an important aid in the diagnosis, evaluation and management of the toxæmias of pregnancy. As a result of their observations, they examine the retina at frequent intervals (daily in seriously ill patients), and the decision to terminate a pregnancy may depend largely on such observations. The services of an ophthalmologist are considered essential in the proper conduct of an obstetrical department.

Special Articles for the Clinician.

(CONTRIBUTED BY REQUEST.)

XXI.
THE RH FACTOR.

THERE are few things more fascinating than the study of the development of an idea in any field of human activity; it is something like tracing the sources of a great river. In the case of the discovery of the Rh factor, one source was fœtal and neonatal disease. The recognition of *hydrops fœtalis*, according to Ballantyne, dates back to the days of Hippocrates. Another source was unexplained transfusion reactions. A third source was the basis for Landsteiner's conviction that the discovery of the four blood groups was incomplete; he believed that the subject of blood groups was infinitely complex, and that there were even individual differences in human blood. The first two sources of the Rh river met when Levine and Stetson (1939) reported a transfusion accident in a puerperal patient and suggested the possibility of the immunization of a pregnant woman by an antigen derived from her child. The first mention of Rh in the literature came when Landsteiner and Wiener (1940), who had been working on some discrepancies in the reactions of anti-M and anti-N sera, reported the finding of a new property in human blood which they named Rh, since it was present in the blood of rhesus monkeys. The third tributary joined the first two a few months later when Wiener and Peters (1940) described three instances of hæmolytic transfusion reactions and—here came the original flash of thought—identified the atypical agglutinin in each case with their anti-Rh immune agglutinin prepared in rabbits. Levine and his co-workers (1941) showed that the formation of an atypical agglutinin in the blood of a pregnant woman sometimes resulted in the birth of an infant with erythroblastosis, or as it is now called, hæmolytic disease of the newborn. The agglutinin concerned was identified with the anti-Rh agglutinin discovered by Wiener and Peters; in a series of 153 mothers of affected infants 92% were Rh-negative and had Rh-positive husbands.

Since these early discoveries, the Rh river has been in full spate; an enormous amount of literature has accumulated on the subject. It was soon found that the Rh factor was not a single substance but a group of substances, serologically and genetically complex, and further that its distribution varied in different races of mankind. The flood of medical literature was therefore increased by papers related to genetics and ethnology. Good reviews have been published from time to time. (W. C. Boyd, 1945; E. L. Potter, 1947; M. M. Pickles, 1949; R. R. Race, 1950.) These have been freely used in the preparation of this article. One of the most useful of all is "Blood Transfusion in Clinical Medicine", by P. L. Mollison. A new Medical Research Council Memorandum on "The Blood Groups" by Mollison is to be published shortly.

Rh Nomenclature.

As the complexity of the Rh factor was unravelled, the original nomenclature was elaborated to fit each new discovery by adding indices to the letters Rh, by reversing these letters and by other means. Later "short symbols", in which the "h" was dropped, were used. (See Table II.) These were logical procedures, but they made the literature increasingly difficult for the average reader to follow. Tests with the original anti-Rh rabbit serum of Wiener and Peters and with other animal sera had shown that 85% of a sample of the population of New York were Rh-positive, the remainder Rh-negative; but it was soon found that human anti-Rh sera derived from mothers or from patients who had had transfusion reactions gave discrepant results. Levine and others described a serum obtained from an Rh-negative mother which reacted with 88% of the population; they concluded that it contained a mixture of two types of anti-Rh agglutinins. Landsteiner and Wiener (1941) found an anti-Rh serum which agglutinated only 70% of human bloods. By such means three varieties of Rh were identified. This, however, was by no means the end of the story; in fact it seems doubtful whether the Rh story is ever to come to an end. In December, 1943, Wiener published a genetic theory of the Rh types distinguishing five "partial antigens" in the Rh-positive gene. Race and his associates, working in England, showed that they had come to the same conclusion as Wiener. Race and Taylor (1943) also identified a serum "St" (St being the first two letters of the patient's name) obtained from an Rh-positive mother, which reacted with the red cells of all Rh-negative and of all heterozygous (Rh rh) Rh-positive persons. This resembled a serum described by Levine and others (1941) and called by them anti-Hr.

The CDE Nomenclature.

Genes, the submicroscopic units which determine the inherited characteristics of animals and plants, are believed to be arranged, serial fashion, in rod-like structures called chromosomes: these chromosomes occur singly in reproductive cells, but are paired in the cells of the fertilized gamete, one of each pair being derived from each parent. A complicating factor is the availability in some instances of more than one gene capable of occupying the same chromosome site. Such genes are called allelomorphs. Wiener (1943) described six allelomorphic genes concerned in the Rh factor, naming them Rh_1, Rh_2, Rh_0, Rh′, Rh″ and rh. An alternative nomenclature was suggested by Fisher (1944), who had observed that the reactions given by the anti-Rh_1 and "St" sera were mutually antithetical, and concluded that they were reacting with allelomorphic antigens which he called C and c. The other two available sera, anti-Rh_0 and anti-Rh_2, gave reactions which were not completely anti-

TABLE I.
The Different Rh Antisera.[1]

Fisher Terminology.	Wiener Terminology.	Approximate Percentage Frequency in Persons Sensitized to Rh^{sa}.
Anti-D	Anti-Rh_0	60
Anti-C	Anti-rh′	2
Anti-C^w	Anti-rh^w	—[2]
Anti-E	Anti-rh″	1
Anti-d	Anti-Hr_0	—[2]
Anti-c	Anti-hr′	1
Anti-e	Anti-hr″	—[2]
Anti-D+anti-C	Anti-Rh_1	30
Anti-D+anti-E	Anti-Rh_2	2

[1] From Wintrobe, 1951, adapted from Mollison, Mourant and Race, 1948.
[2] Only isolated examples reported.

TABLE II.
Rh Chromosomes.[1]

Fisher.	Short Notations Much Used.	Wiener, 1949.
CDe	R_1	R^1
cde	r	r
cDE	R_2	R^2
cDe	R_0	R^0
C^wDe	R_1^w	R^{1w}
cdE	R^b	r″
Cde	R′	r′
CDE	R_z	R^z
C^wde	R'^w	r'^w
CdE	R_y	r^y
C^wDE	R_z^w	Of very low frequency.
C^wdE	R_y^w	Of very low frequency.

[1] From Race, Mourant, Lawler and Sanger, 1948; quoted by Race and Sanger, 1950.

thetical: Fisher named the antigens with which they reacted D and E and predicted that the existence of allelomorphs d and e would be proved by the discovery of antibodies. This prediction was fulfilled (see Table I) and Fisher's nomenclature is widely used. Wiener and his school have attacked Fisher's theory and nomenclature on various grounds and prefer to use the original Rh nomenclature for denoting antigens and a shortened form of it for denoting genotypes. British workers, in addition to the CDE nomenclature, use for convenience in conversation a shorthand notation based on but differing from that of Wiener. (See Table II.) As knowledge increases and the subject grows more and more complex, the question of nomenclature becomes very difficult. Race and Sanger (1950) describe 55 possible genotypes for the ten chromosomes which have been identified; but for our comfort they emphasize the fact that:

> The form of antibody first discovered and called anti-Rh occurs so much more frequently that it may be said to be responsible for 95% of all the dangers due to the

> Rh blood groups. The basic story told by Landsteiner and Wiener is still true, and subsequent increase in knowledge of the complexities of these groups is of far greater importance from the genetical and serological than from the clinical point of view.

It is still useful in clinical practice to use the terms Rh-positive and Rh-negative and to speak of anti-Rh agglutinins. It is useful to know that the original anti-Rh serum is now called anti-D or anti-Rh_0, and that persons lacking the antigen D (or Rh_0) are those most likely to develop antibodies. From the clinical point of view Rh′ and Rh″ (Cde and cdE) should be classed with the rh(cde) individuals as Rh-negative. As potential donors, however, they should be considered as Rh-positive, since Rh-negative recipients, if already immunized, have in over 65% of cases been immunized against the C antigen as well as against D. Rh tests are carried out in many hospitals and private laboratories, but the responsibility of dealing with the complications of the Rh factor must fall in the last resort on transfusion centres; in this country usually on the laboratories of the Red Cross Transfusion Service. As Race and Sanger (1950) observe, Rh grouping can be carried out at many levels of discrimination.

Iso-Immunization by Rh.

The most important single property of the Rh factor in human blood is that it is antigenic; that is, when Rh-positive blood is injected into an Rh-negative person, iso-immunization can occur with the production of anti-Rh agglutinins. In clinical practice this happens in two ways: the first is by parenteral injection of Rh-positive blood, usually by transfusion, but also by intramuscular injection; the second is by the pregnancy of an Rh-negative mother with an Rh-positive child. Pregnancy is a more common cause of Rh sensitization than repeated transfusions, for transfusion is after all still a comparatively rare event. Transfusion, however is the more powerful stimulus. In this regard, however, it must be remembered that Rh sensitization occurs in only a small proportion of pregnancies, and of families in which it is theoretically possible. In the majority of families in which the mother is Rh-negative and the father Rh-positive, hæmolytic disease does not occur. Race and Sanger (1950) state that the incidence of the disease is no higher than one in ten of pregnancies which provide the necessary conditions. The reason why it occurs in an unfortunate minority of Rh-positive Rh-negative marriages is not understood; it has been postulated that there is an impairment of the placental barrier in affected mothers. Whether this is so or not, the process of Rh sensitization, like all immune responses, is a very variable one. Transfusion or even intramuscular injection of blood is a far more powerful stimulus to Rh antibody formation than pregnancy. Race and Sanger (1950) write:

> Many people must have died as a result of transfusion of Rh-positive blood—Rh-negative people who had previously been immunized by transfusion or by pregnancy. A very much greater number of babies must have died because their mothers had had a transfusion of Rh-positive blood at some time in their life, perhaps long before the pregnancy. It is known that about half the Rh-negative persons who receive Rh-positive blood develop anti-Rh, and that small injections of blood can have the same effect.

Blocking Antibodies.

At first tests for anti-Rh agglutinins were performed by incubating Rh-positive cells suspended in citrate with the serum under investigation for two hours at 37° C. One puzzling fact was that the antibodies could not always be demonstrated in the sera of Rh-negative mothers of infants with severe hæmolytic disease. The explanation was given independently by Wiener in America and Race in England, when they showed that Rh antibodies in human sera occurred in two forms: saline or "agglutinating" antibodies and "blocking" or "incomplete" antibodies. The latter were demonstrated in a two-stage experiment. The serum to be tested was incubated for half an hour at 37° C. with a 2% suspension in saline of Rh-positive cells. When no agglutination occurred, a known anti-Rh agglutinating serum was added to the mixture which was then incubated further. If no agglutination occurred in this second stage, it was concluded that the first serum contained blocking antibodies, since it had "blocked" the cells, that is, had altered them in such a way that they could no longer be agglutinated by a known anti-Rh agglutinating serum. Later it was found that blocking antibodies could be demonstrated in other ways: for instance, Rh-positive cells suspended in 25% human or 20% bovine albumin showed specific agglutination with serum containing a blocking antibody. These incomplete antibodies have been described by various investigators as blocking, partial, inhibiting, coating, hyper-immune, mature, non-agglutinating or albumin antibodies. In many sera both saline and blocking antibodies are present.

Anti-Human-Globulin Test (Coombs Test).

The incomplete antibody had thus been discovered by the fact that it could "block" or "coat" Rh-positive cells. "Coat" is rather a misleading term; the interaction of red cell and antibody is more like a chemical combination. Coombs, Mourant and Race devised a test for detecting this change in the cell. Their test depends on the fact that the Rh antibodies, like many other antibodies, are part of the globulin fraction of human serum. The presence on the red cells of this portion of the globulin fraction makes them agglutinable by an anti-human-globulin serum. Such a serum is prepared by the immunization of rabbits with whole human serum or with globulin. For the test the red cells must be washed free from plasma and suspended in saline. One drop of an approximately 5% saline suspension of the washed cells is mixed on a tile or a slide with a drop of a suitably diluted anti-human-globulin serum, left for a minute, and then rocked gently for three or four minutes to see if agglutination occurs. Usually with "blocked" (that is, "sensitized") cells, agglutination will be clearly seen by the naked eye; occasionally a hand lens may be needed. This constitutes the direct Coombs test or direct anti-human-globulin test. As its name implies, it is not specific for Rh antibodies; it only indicates the presence of some antibody globulin on the red cells. In certain forms of acquired hæmolytic anæmia and after an incompatible blood transfusion, the red cells may react to the Coombs test. In newly born infants, however, a positive direct reaction to the Coombs test almost certainly means that the cells have been sensitized *in utero* by some kind of Rh antibody, and this is the most useful single test for hæmolytic disease.

The indirect Coombs test is used for detecting incomplete antibodies in serum. It is a two-stage test. The unknown serum is incubated for thirty minutes at 37° C. with a saline suspension of Rh-positive cells. These are then washed and mixed on a slide with rabbit anti-human-globulin serum; agglutination indicates the presence of antibody in the unknown serum.

When Should Rh Tests be Performed?

Rh tests should be performed on the recipient's cells before every transfusion or injection of blood, whether to man, woman or child. If this cannot be done in an emergency, the risks must be weighed against the danger of withholding transfusion. To quote Mourant (1948): "The greatest risks are run when a woman of unknown Rh type is transfused with Rh-positive blood." The woman may be Rh-negative and have antibodies in her serum as a result of a previous pregnancy, miscarriage or transfusion. If she is nulliparous and has never received a transfusion or injection of blood, no immediate harm will occur, but her future children may be severely affected by hæmolytic disease. The supply of Rh-negative blood is limited; in order to conserve it for Rh-negative persons it is essential to determine the Rh group of all recipients.

Of equal importance is the routine testing of the blood during pregnancy. In every pregnancy, preferably at the third month, the mother's Rh group should be determined; if she is Rh-negative her serum should be tested for anti-Rh agglutinins, and these, if present, should be identified at a transfusion centre. At least two examinations should be made—one when the patient is first seen, the other about six weeks before term. If anti-Rh agglutinins are being formed as a result of the present pregnancy, they are seldom detectable before the fifth month. The finding of agglutinins at an early stage indicates therefore that they were present before the woman became pregnant and it may be important to know this. As regards the second examination, if antibody is being formed, it is almost always detectable by the thirty-fourth week and its presence is a strong indication that the coming child will be affected. When possible, additional tests may be made during pregnancy; at present there is a good deal of doubt about the interpretation of changes in the titre of agglutinins and the extra work involved in making more than two tests as a routine is hardly justified unless the information is being used for research. By the performance of routine tests during pregnancy, the occurrence of hæmolytic disease of the newborn will be anticipated in most cases. Should it occur unexpectedly, the mother's blood must be tested for Rh and Rh antibodies, even when previous tests have shown her to be Rh-positive; and also for other atypical agglutinins. Hæmolytic disease has, for example, very occasionally occurred as a result of a marked increase of anti-A or anti-B during pregnancy.

Rh tests should be performed on the blood of a newly born child when the mother's history suggests that one or more of her children has had hæmolytic disease, when her serum has been shown to contain Rh agglutinins, or when there is clinical evidence of hæmolytic disease. In addition, a Coombs test (anti-human-globulin test) should be done together with estimations of hæmoglobin and of serum bilirubin, a reticulocyte count and the examination of a blood film. Samples of cord blood should be collected at delivery whenever it is likely that these tests will be required; this saves time and is far simpler than collecting the required amount of blood from the child after birth. It is convenient to have two tubes in readiness, one of which contains an anticoagulant. Once the blood is collected the tube containing the anticoagulant should be gently shaken so that the blood is thoroughly mixed with the anticoagulant (heparin or oxalate) and both tubes sent at once to the laboratory, so that a pathologist (forewarned if possible) can carry out the necessary tests without delay.

The Treatment of Hæmolytic Disease of the Newborn.

"Hæmolytic disease of the newborn varies from being so mild that the diagnosis can only be established by laboratory tests, to being so severe that the infant lives for only a few minutes after birth" (Mollison and Cutbush, 1951). Infants with obviously severe disease shown by anæmia with large numbers of very immature cells in the circulation, with jaundice or œdema or both, and with enlargement of the liver and spleen, will, of course, receive immediate treatment, preferably exchange transfusion. As Pickles (1949) says, the difficulty comes in drawing the distinction between babies who will develop only mild disease and those who, though they appear normal at birth, show a rapidly developing jaundice with or without anæmia. A "wait and see" policy may be disastrous, for babies which appear almost normal at birth may rapidly become jaundiced or anæmic and die within a few hours. So that it is most important to make a diagnosis and to attempt to assess the severity of the case at birth. A careful clinical examination of the infant is essential. The *vernix caseosa* may be yellowish. Slight œdema of the face, especially the eyelids; faint petechiæ, becoming more marked; and moderate enlargement of the spleen are of serious significance. Slight jaundice may be missed at night unless a very good light is available. Every maternity hospital should have at least one good "daylight" lamp. The placenta should be carefully inspected and weighed; the ratio of its weight to that of the child is important. Some, at least, of the results of tests may be available by the time the clinical examination has been completed. Assessment of the severity of the case depends on the clinical findings, the maternal history and the results of laboratory tests: a Coombs test to confirm the diagnosis, and estimations of hæmoglobin, serum bilirubin, and reticulocytes, together with the examination of a blood film. The most important of all guides is the clinical condition of the child, but estimations of the hæmoglobin and serum bilirubin will help greatly in deciding the treatment required. Pickles (1949) states that:

> With a serum bilirubin level of 2·5mg.% or less, in spite of a high degree of sensitization, the infants will probably do well without treatment, though they may be benefited by a small transfusion. A serum bilirubin raised above this level, together with evidence of a high degree of sensitization, indicates the necessity for treatment, preferably by exsanguination transfusion.

Mollison and Cutbush (1951) have shown that the hæmoglobin concentration of the cord blood of affected infants is very closely related to their chance of survival; in their opinion this is the most useful single test in assessing the severity of the case once it has been diagnosed. In their series of cases of proved hæmolytic disease exchange transfusion was carried out on all infants unless they were moribund at birth or unless the cord hæmoglobin concentration was greater than 15·5 grammes *per centum*. Analysing their figures retrospectively, they state that:

> If it had been forecast that all infants whose cord hæmoglobin concentrations exceeded 9·6 grammes per cent. would survive and all those whose cord concentrations were lower would die, correct predictions could have been made in 89 out of 95 cases (94%).

Another important comment these workers make is that:

> Infants with positive direct Coombs' tests whose cord hæmoglobin concentrations exceed 15·5 gm./100 ml. have some risk (approximately 1 in 12) of developing kernicterus, if untreated.

In regard to the transfusion of infants suffering from hæmolytic disease, Rh-negative blood should be used; while it is preferable to use Rh-negative blood of the same A B O group as the child, it is often most practicable to use O Rh-negative blood, for valuable time may be lost in securing Rh-negative blood of the child's own group. It has been shown that better results are obtained with female blood than with male blood. As to prevention, there is at present no known way of preventing the affection of a child *in utero*. Induction of labour at the thirty-sixth week is believed by some to improve the infant's chance of survival. Obviously the extra hazards of prematurity and of induction must be considered.[1] There is some evidence that kernicterus is more likely to occur in premature infants. (It would prolong this article unduly to include a discussion of the pathology of hæmolytic disease; there are many good accounts of it in the literature; see especially Potter, 1947, and Pickles, 1949; both have excellent bibliographies.)

Prognosis for Future Pregnancies in Mothers of Affected Children.

A difficult problem is the giving of advice to parents about future pregnancies. It was established soon after the discovery of the original Rh antigen (D, Rh_0) that it was inherited as a Mendelian dominant character; Rh-positive persons are of two genetical types, homozygous (RhRh, DD, Rh_0Rh_0) and heterozygous (Dd, Rhrh, Rh_0rh). Mollison writes:

> In practice, most (75%) of fathers of children affected with hæmolytic disease are homozygous for the Rh factor. This is probably because Rh-negative women usually only become immunized to Rh after having had two or three Rh-positive infants. When the husband is heterozygous for Rh his wife will have to have on the average twice as many children to get the same number of Rh-positive ones and such large families are uncommon. Thus in most cases when a woman has had one infant affected with hæmolytic disease, it is likely that her husband is homozygous for Rh and that all her future infants will be affected. At the same time in an individual case such a general statement is of little value and steps must be taken to discover whether the father in question is Dd. (M.R.C. Memorandum No. 19, 1948.)

It must be remembered that the determination of genotypes often involves a guess. It must also be remembered that even when the father is homozygous there is still some chance of the couple having a child which, although affected at birth, may recover and eventually be quite healthy. It is true that there is a tendency for the disease to be increasingly severe, or at least of equal severity in succeeding pregnancies, but exceptions to this rule do occur. Bryce Jacobowicz, Graydon and Campbell (1951), reporting a series of 71 affected infants, observe that several cases in their series illustrate the fact that the disease does not always become progressively severe in succeeding pregnancies. In advising parents of affected children, it is best to speak always of probabilities rather than of certainties. Rh-negative mothers with Rh-positive husbands who are pregnant for the first time or who have had no affected children can be reassured by quoting the figures of Race and Sanger (1950) which show that the incidence of the disease is no higher than one in ten of pregnancies which provide the necessary conditions, or those of Bryce and her co-workers (1951), who found Rh agglutinins in only seventy-one (4·5%) of 1584 Rh-negative mothers.

The situation of an affected family, caught in the inexorable net of the Rh factor, is indeed a very distressing one. It is remarkable with what courage and equanimity some women meet these family tragedies even when no mitigation is possible. As regards mitigation, Pickles (1948) writes:

> If there seems to be no possibility of obtaining a living child in view of a family history culminating in repeated stillbirths, the possibility of artificial insemination by an Rh-negative donor might occasionally be considered.

This, however, raises moral and legal questions which are outside the scope of this article.

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[1] Since the above was written controlled trials of treatment in Britain have shown that "the practice of inducing labour 3-5 weeks before the expected day of delivery was associated with a lower proportion of surviving infants than was the practice of allowing delivery to occur spontaneously, though the difference did not quite reach the conventional level of significance" (Mollison, P. L., and Walker, W. (1952), "Controlled Trials of the Treatment of Hæmolytic Disease of the Newborn", *The Lancet*, Volume I, page 429).

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British Medical Association News.

ANNUAL MEETING.

THE annual meeting of the New South Wales Branch of the British Medical Association was held at the Robert H. Todd Assembly Hall, British Medical Association House, 135 Macquarie Street, Sydney, on March 27, 1952, DR. K. C. T. RAWLE, the President, in the chair.

ANNUAL REPORT OF COUNCIL.

The annual report of the Council was received and adopted on the motion of Dr. H. R. R. Grieve, seconded by Dr. G. C. Halliday. The report is as follows.

The Council presents the following report on the work of the Branch for the year ended March 27, 1952.

Membership.

The membership of the Branch is now 3360, as against 3125 at the date of the last report. The additions have included 296 elections, reelections and resumptions, and 71 removals into the area of the Branch; while the losses have included 12 by resignation, 67 removals out of the area of the Branch, 20 by default in payment of subscription, and 33 by death. The losses by death were as follows: Dr. I. H. MacGillivray, Dr. V. T. Goldrick, Dr. D. Buchanan, Dr. Clarence Read, Dr. P. N. Pedersen, Dr. S. Cohn, Dr. O. Perdriau, Dr. A. N. Homewood, Dr. D. Fogarty, Dr. G. L. Bell, Dr. D. M. Stewart, Dr. G. M. Duncan, Dr. F. P. Quirk, Dr. S. G. Bradfield, Dr. H. R. Hill, Professor J. C. Windeyer, Dr. J. W. Hart, Dr. L. H. Foy, Dr. May Harris, Dr. A. H. Crowley, Dr. J. L. B. Dixon, Dr. A. F. Oxenham, Dr. G. J. Lees, Dr. T. A. Daly, Dr. G. R. Walker, Dr. W. C. McClelland, Dr. J. M. Hair, Dr. G. A. Hardwicke, Dr. J. Macarthur, Dr. G. F. Hewer, Dr. N. W. Hansard, Dr. R. D. Goldie, Dr. J. J. O'Keefe.

Meetings.

Ten ordinary meetings of the Branch (including the annual general meeting), four extraordinary meetings of the Branch, and ten clinical meetings were held; the average attendance was 85.

Eight ordinary meetings were held in conjunction with meetings of the special groups, namely: April 26, with the Section of Obstetrics and Gynæcology and the Section of Medicine; May 31, with the Section of Neurology, Psychiatry and Neurosurgery and the Section of Allergy; June 28, with the Section of Surgery and the Section of Pathology; July 26, with the Section of Medicine and the Section of Pathology; August 30, with the Section of Medicine and the Orthopædic Group (British Medical Association); September 27, with the Section of Pædiatrics and the Section of Radiology; October 25, with the Section of Neurology, Psychiatry and Neurosurgery and the Orthopædic Group (British Medical Association); November 29, with the Section of Surgery and the Section of Anæsthesia. At the ordinary meeting on December 13 an address was given by Sir Frank Macfarlane Burnet. Seventeen papers were presented at these meetings.

The clinical meetings were held at the Rachel Forster Hospital for Women and Children, Royal Alexandra Hospital for Children, Royal Prince Alfred Hospital, Royal North Shore Hospital, Saint Vincent's Hospital, Lewisham Hospital, Sydney Hospital, The Women's Hospital (Crown Street), Broughton Hall Psychiatric Clinic and Saint George Hospital.

At the extraordinary general meeting held on March 29, by-law 26 was deleted and a new by-law substituted in lieu thereof. The new by-law dealt with the provision of medical services to friendly society members on a concessional fee-for-service basis.

At the extraordinary general meeting held on June 5, consideration was given to the Pensioner Medical Service of the Commonwealth Government.

At the extraordinary general meeting held on October 25, by-law 4 (Annual Subscription) was amended. A proposal submitted by Council for the constitution of a new by-law (by-law 36) (Ethical Rules for Industrial Medical Officers) was not approved.

At the extraordinary general meeting held on December 13, by-law 4 (Annual Subscription) was further amended.

Meetings of Branch in Country Towns.

In its desire to make the facilities of the Branch available to as many members as possible, the Council has decided to hold occasional Branch meetings in the larger country towns.

The first of such meetings will be held at Orange at the week-end October 25-26, 1952.

Representatives.

The Branch was represented as follows:

1. Council of the British Medical Association (1949-1952): Dr. Isaac Jones.
2. Representative Body of the British Medical Association (1951-1952): Dr. E. F. Thomson.
3. Federal Council of the British Medical Association in Australia: Dr. A. J. Collins, D.S.O., M.C., Dr. H. R. R. Grieve, Dr. W. F. Simmons, Dr. A. J. Murray, O.B.E.
4. Australasian Medical Publishing Company, Limited: Dr. W. F. Simmons, Dr. W. L. Calov, Professor L. E. Dods, M.V.O.
5. New South Wales Post-Graduate Committee in Medicine, Dr. A. C. Thomas, Dr. E. F. Thomson.
6. The Ophthalmic Association, Limited: Dr. E. V. Waddy Pockley.
7. The Flying Doctor Service of Australia: Representative, Dr. George Bell, O.B.E.; Deputy Representative, Dr. J. G. Hunter.
8. Council of the Bush Nursing Association: Dr. K. C. T. Rawle.
9. Hospitals Contribution Fund of New South Wales: Dr. Hugh Hunter.
10. Saint John Ambulance Association: Dr. K. C. T. Rawle.
11. Standards Association of Australia: (i) Institutional Supplies Committee, Dr. S. W. G. Ratcliff; (ii) Sectional Committee on Interior Illumination of Buildings, Dr. N. M. Macindoe; (iii) Committee on Standards of Laboratory Glassware and Volumetric

Glassware, Dr. F. S. Hansman; (iv) Committee on Protective Glass for Welding, Dr. N. M. Macindoe; (v) New South Wales Committee on Protective Occupational Clothing, Dr. W. T. Nelson; (vi) Paint and Varnish Subcommittee Number 8, Dr. W. T. Nelson; (vii) New South Wales Committee on Eye Protection, Dr. N. M. Macindoe; (viii) Sectional Committee on Measuring Cups and Spoons, Dr. W. W. Ingram; (ix) Conference for Standards in Breathing Apparatus, Masks and Associated Equipment, Dr. W. E. George.

12. Medical Officers' Relief Fund (Federal): Local Committee of Management for New South Wales, Dr. E. H. M. Stephen, Dr. A. J. Murray, O.B.E., Dr. A. J. Collins, D.S.O., M.C.
13. Medical Appointments Advisory Committee (Hospitals Commission of New South Wales): Dr. B. T. Edye.
14. Special Departmental Committee for the Investigation of Maternal Deaths: Dr. E. A. Tivey.
15. Recreation and Leadership Movement: Professor Harvey Sutton.
16. Council of the Royal Society for the Welfare of Mothers and Babies: Sir Robert Wade, Dr. E. H. M. Stephen.
17. New South Wales Medical Board: Dr. J. R. Ryan.
18. Council of the New South Wales Institute of Hospital Almoners: Dr. R. A. R. Green.
19. Council of Education: Dr. A. J. Collins, D.S.O., M.C.
20. Examining Council of the Society of Laboratory Technicians of Australasia (New South Wales Branch): Dr. F. S. Hansman and Dr. E. F. Thomson.
21. Medical Finance, Limited, Board of Directors: Dr. E. A. Tivey, Dr. A. C. Thomas, Dr. George Bell, O.B.E., Dr. G. C. Halliday.
22. Council of the New South Wales Institute of Dietitians: Dr. H. R. R. Grieve.
23. Coordinating Council for the Physically Handicapped: Dr. R. A. R. Green.
24. Road Safety Council of New South Wales: Dr. K. C. T. Rawle; Committee for the Determination of Visual Standards for Motor Drivers, Dr. N. McA. Gregg; Committee for the Determination of Physical Fitness of Drivers of Motor Vehicles, Dr. J. H. Halliday; Committee to Examine and Report on Matters Dealing with Road Accidents Involving Motor Cycles, Dr. I. D. Miller.
25. Federal Medical War Relief Fund: Local Committee of Management, Dr. A. J. Collins, D.S.O., M.C., Dr. A. C. Thomas, Dr. A. J. Murray, O.B.E.
26. Florence Nightingale Memorial Committee of Australia: Dr. B. T. Edye.
27. National Association for the Prevention of Tuberculosis in Australia, New South Wales Division: Coordinating Committee, Dr. W. Cotter B. Harvey.
28. The Committee for Placement of Resident Medical Officers: Dr. A. M. McIntosh.
29. Council of the Australian and New Zealand Association for the Advancement of Science: Twenty-eighth meeting, May 23-30, 1951, Brisbane. Delegates, Dr. Ethel B. Durie, Professor Harvey Sutton, O.B.E.
30. Australian Physiotherapy Association: Dr. B. G. Wade.
31. University of Sydney: Centenary Celebration Committee, Dr. G. C. Halliday.
32. The Cavalcade of Nursing Committee: Dr. H. R. R. Grieve.
33. New South Wales State Cancer Committee and Cancer Advisory Committee: Dr. B. T. Edye.

Council.

(*a*) The attendance of members of the Council and of the standing committees was as set out in the accompanying table.

(*b*) In view of there being a failure to nominate for election at the annual (1951) election of Council a second member to represent country local associations in accordance with Article 38 of the Articles of Association, the Council in the exercise of its powers under Article 40 (2) elected Dr. F. P. M. Solling a member of the Hunter Valley Medical Association to the vacancy.

(*c*) The representatives of the Local Associations of Members appointed on the invitation of the Council to attend the regular quarterly meetings of the Council were as follows: Dr. W. McP. Roberts (Blue Mountains), Dr. L. S. Woods (Border), Dr. J. M. Dowling (Brisbane Water District), Dr. L. Abramovich (Canterbury-Bankstown), Dr. G. N. M. Aitkens (Central Western), Dr. C. M. Burns (Eastern Suburbs), Dr. A. McNeil (Eastern District), Dr. W. A. Conolly (Hunter Valley), Dr. G. W. Ashby (Illawarra Suburbs), Dr. T. S. Douglas (Northern District), Dr. A. McL. Harper (South Eastern), Dr. C. H. Jaede (South Sydney), Dr. E. S. Stuckey (Warringah District), Dr. R. D. Mulvey (Western).

Library.

Dr. J. Kempson Maddox was appointed to the position of Honorary Librarian.

Visitors to the library	6409
Books lent to members	1250
Journals lent to members	4415
Books added to the library	185
Journals added to the library	20

ATTENDANCE AT COUNCIL AND STANDING COMMITTEE MEEEINGS.

	Council.	Committees.				
		Executive and Finance.	Organization and Science.	Medical Politics.	Hospitals.	Ethics.
ALEXANDER, M. S.	10	—	—	11	—	—
ANDERSON, PHYLLIS M.	10	—	2	—	—	—
BELL, GEORGE. Honorary Treasurer	11	11	1	3	2	1
BLACKBURN, SIR CHARLES	8	—	—	—	—	1
COOK, B. A.	9	—	—	6	—	—
DEAKIN, J. E. F.	10	—	—	—	3	—
EDYE, B. T.	11	—	—	—	—	1
ELLIOTT, G. F.	9	—	—	—	3	—
GRIEVE, H. R. R. Honorary Secretary	10	10	—	7	1	1
HALLIDAY, G. C. Past President	8	9	—	—	—	—
HOWE, G. L.	9	11	—	10	—	—
JOHNSON, A. S.	8	—	2	—	—	—
MACDONALD, R. H. President-Elect	10	11	3	8	3	1
MAGUIRE, F. A.	5	—	—	—	—	—
MCINTOSH, A. M.	7	—	—	—	—	1
MORROW, A. W.	9	—	2	—	2	—
MURRAY, A. J.	7	10	—	—	—	1
NELSON, T. Y.	10	—	—	9	3	—
RAWLE, K. C. T. President	10	11	—	8	2	1
SIMMONS, W. F.	11	12	—	11	—	—
SOLLING, F. P. M.	6	—	—	6	—	—
THOMAS, A. C.	10	10	—	—	—	—
THOMSON, E. F.[1]	4	—	2	—	—	—
WILLIS, H. H.	9	—	—	10	2	—
Meetings held	11	12	3	11	3	1

[1] Leave of absence April to November, 1951

It is satisfactory to note that there has been very little alteration in the figures as compared with the year 1950-1951, and although the number of visitors to the library has decreased slightly, loans of books and journals have increased.

A copy of the Branch Library Catalogue was forwarded to each member, and complimentary copies sent to all Branch libraries and various medical and allied libraries in the Commonwealth.

The Association would like to acknowledge its appreciation of the cooperation and assistance rendered throughout the year by the libraries of the other Branches and kindred institutions, and is pleased to record its grateful thanks for donations received from the following: the Editor, THE MEDICAL JOURNAL OF AUSTRALIA; Dr. Douglas Anderson; Australian Federation of Medical Women; Australian Institute of Anatomy; Dr. J. C. Belisario; Dr. R. H. Bettington; Professor J. Bostock; Dr. D. C. Carruthers; Commonwealth Department of Health; Council for Scientific and Industrial Research; Dr. H. J. Daly; Dr. Clyde Davis; Dr. W. S. Dawson; Dr. C. F. A. de Monchaux; Dr. D. A. Denton; Dr. E. A. O. Fulde; Dr. T. M. Furber; International Labour Office; Dr. Douglas McAlpine (London); Dr. A. M. McIntosh; Dr. J. K. Maddox; the Mayo Clinic; University of Melbourne; Minister for Health, Tasmania; Queensland Institute of Medical Research; South Pacific Commission; Royal Australasian College of Physicians; Dr. M. P. Susman; Dr. A. C. Telfer; UNESCO; United States Information Library; Dr. R. J. Whiteman; Dr. T. E. Wilson; the World Medical Association; the Section of Neurology, Psychiatry and Neurosurgery; the Section of Obstetrics and Gynæcology; the Section of Pathology; the College of Radiologists (Aust. and N.Z.); the Oto-Rhino-Laryngological Society of New South Wales (British Medical Association); and the Dermatological Association of Australia (British Medical Association).

Affiliated Local Associations of Members.

Blue Mountains (affiliated 1944): *Chairman*, Dr. L. Bamber; *Honorary Secretary*, Dr. N. Larkins. Membership 28. Four meetings were held.

Border (affiliated 1908): *Chairman*, Dr. R. A. Robertson; *Honorary Secretary*, Dr. F. G. Favaloro. Membership 17. Three meetings were held.

Brisbane Water District (affiliated 1948): *Chairman*, Dr. G. C. Duncan; *Honorary Secretary*, Dr. J. M. Dowling. Membership 15. Six meetings were held.

Broken Hill (affiliated 1942): *Acting Chairman*, Dr. Franziska Schlink; *Honorary Secretary*, Dr. J. T. Cullen. Membership 15. Ten meetings were held.

Canterbury-Bankstown (affiliated 1930): *Chairman*, Dr. K. J. Lazarus; *Honorary Secretary*, Dr. J. T. St. Leger Moss. Membership 58. Five meetings were held.

Central Northern (affiliated 1910): *Chairman*, Dr. W. Barnes; *Honorary Secretary*, Dr. H. W. Rundle. Membership 77. Four meetings were held.

Central Southern (affiliated 1909): *Chairman*, Dr. A. G. Wise; *Honorary Secretary*, Dr. J. P. Lyttle. Membership 43. One meeting was held.

Central Western (affiliated 1910): *Chairman*, Dr. B. R. Morey; *Honorary Secretary*, Dr. K. S. M. Brown. Membership 66. Three meetings were held.

Eastern District (affiliated 1913): *Chairman*, Dr. M. E. H. Elliott; Honorary Secretary, Dr. A. McNeil. Membership 33. One meeting was held.

Eastern Suburbs (affiliated 1911): *Chairman*, Dr. T. J. Ritchie; *Honorary Secretary*, Dr. L. H. McMahon. Membership 132. Three meetings were held.

Far South Coast and Tablelands (affiliated 1935): *Chairman*, Dr. E. C. Blomfield; *Honorary Secretary*, Dr. J. F. Ireland. Membership 13. Three meetings were held.

Hunter Valley (affiliated 1947): *Chairman*, Dr. W. A. Conolly; *Honorary Secretary*, Dr. F. P. M. Solling. Membership 40. Five meetings were held.

Illawarra Suburbs (affiliated 1913): *Chairman*, Dr. K. S. Richardson; *Honorary Secretary*, Dr. G. W. Ashby. Membership 94. Five meetings were held.

Kuring-gai District (affiliated 1929): *Chairman*, Dr. J. H. Carman; *Honorary Secretary*, Dr. J. Woolnough. Membership 82. Five meetings were held.

Northern District (affiliated 1911): *Chairman*, Dr. W. H. Spencer; *Honorary Secretary*, Dr. H. G. Royle. Membership 74. Four meetings were held.

North Eastern (affiliated 1913): *Chairman*, Dr. W. Cletus Smith; *Honorary Secretary*, Dr. N. E. Brand. Membership 64. Three meetings were held.

Southern District (affiliated 1909): *Chairman*, Dr. R. M. Glennie Holmes; *Honorary Secretary*, Dr. J. S. Storey. Membership 24. Four meetings were held.

South Eastern (affiliated 1941): *Chairman*, Dr. J. B. Street; *Honorary Secretary*, Dr. M. C. McKinnon. Membership 30. Eleven meetings were held.

South Sydney (affiliated 1909): *Chairman*, Dr. K. A. Barr; *Honorary Secretary*, Dr. C. H. Jaede. Membership 49. Five meetings were held.

Warringah District (affiliated 1929): *Chairman*, Dr. G. M. B. Hales; *Honorary Secretary*, Dr. M. H. Elliot-Smith. Membership 136. Five meetings were held.

Western (affiliated 1908): *Chairman*, Dr. Brooke Moore; *Honorary Secretary*, Dr. S. R. Dawes. Membership 98. Three meetings were held.

Western Suburbs (affiliated 1908): *Chairman*, Dr. R. J. J. Speight; *Honorary Secretary*, Dr. L. S. Hughes. Membership 130. Seven meetings were held.

Annual Meeting of Delegates.

The thirty-eighth annual meeting of delegates of the affiliated local associations of members with the Council was held on Friday, September 28, 1951.

The delegates present at the meeting were as follows: Blue Mountains, Dr. W. McP. Roberts; Border, Dr. L. S. Woods; Broken Hill, Dr. J. T. Cullen; Brisbane Water District, Dr. J. M. Dowling; Canterbury-Bankstown, Dr. L. Abramovich; Central Southern, Dr. J. P. Lyttle; Central Northern, Dr. H. W. Rundle; Central Western, Dr. G. N. M. Aitkens; Eastern Suburbs, Dr. J. R. Sands; Eastern District, Dr. A. McNeil; Far South Coast and Tablelands, Dr. J. M. Mack; Hunter Valley, Dr. W. A. Conolly; Illawarra Suburbs, Dr. G. W. Ashby; Kuring-gai District, Dr. H. S. Oag; Northern District, Dr. R. J. Jackson; North Eastern, Dr. J. Gribben; Southern District, Dr. F. D. M. Williams; South Eastern, Dr. A. McL. Harper; South Sydney, Dr. C. H. Jaede; Warringah District, Dr. E. S. Stuckey; Western, Dr. R. D. Mulvey; Western Suburbs, Dr. S. Lackey.

Special Groups for the Study of Special Branches of Medical Knowledge.

Allergy (inaugurated 1947): *Chairman*, Dr. R. S. Steel; *Honorary Secretary*, Dr. Bernard Riley. Membership 10. Four meetings were held, one in conjunction with a meeting of the Branch.

Anæsthesia (inaugurated 1934): *Chairman*, Dr. J. F. McCulloch; *Honorary Secretary*, Dr. R. B. Speirs. Membership 37. Four meetings were held, one in conjunction with a meeting of the Branch.

Medicine (inaugurated 1924): *Chairman*, Dr. F. Hales Wilson; *Honorary Secretary*, Dr. Selwyn G. Nelson. Membership 75. Seven meetings were held, three in conjunction with meetings of the Branch.

Neurology, Psychiatry and Neurosurgery (inaugurated 1924): *Chairman*, Dr. Garnet A. Ross; *Honorary Secretary*, Dr. F. J. Scanlan. Membership 87. Eight meetings were held, two in conjunction with meetings of the Branch.

Obstetrics and Gynæcology (inaugurated 1925): *Chairman*, Dr. R. B. C. Stevenson; *Honorary Secretary*, Dr. F. N. Chenhall. Membership 105. Five meetings were held, one in conjunction with a meeting of the Branch.

Orthopædic Group (British Medical Association (inaugurated 1923): *Chairman*, Dr. J. W. van R. Hoets; *Honorary Secretary*, Dr. W. S. L. Stening. Membership 22. Four meetings were held, two in conjunction with meetings of the Branch.

Oto-Rhino-Laryngological Society of New South Wales (inaugurated 1924): *Chairman*, Dr. B. B. Blomfield; *Honorary Secretary*, Dr. R. G. Mackay. Membership 49. Four meetings were held.

Pædiatrics (inaugurated 1924): *Chairman*, Dr. J. Steigrad; *Honorary Secretary*, Dr. D. G. Hamilton. Membership 57. Five meetings were held, one in conjunction with a meeting of the Branch.

Pathology (inaugurated 1924): *Chairman*, Dr. R. D. K. Reye; *Honorary Secretary*, Dr. V. J. McGovern. Membership 78. Nine meetings were held, two in conjunction with meetings of the Branch.

Radiology (inaugurated 1926): *Chairman*, Dr. J. A. Vote; *Honorary Secretary*, Dr. E. W. Frecker. Membership 86. Nine meetings were held, one in conjunction with a meeting of the Branch.

Surgery (inaugurated 1925): *Chairman*, Dr. A. C. Thomas; *Acting Honorary Secretary*, Dr. F. F. Rundle. Membership 35. Three meetings were held, two in conjunction with meetings of the Branch.

Urology (inaugurated 1940): *Chairman*, Dr. C. M. Edwards; *Honorary Secretary*, Dr. H. G. Cummine. Membership 13. Three meetings were held.

British Medical Association Lectures.

Dr. W. A. Hugh Smith delivered two lectures to the Eastern District Medical Association at its annual meeting held at Bellingen on April 28, 1951. The subjects of the lectures were "Backache" and "Disabilities of the Foot".

Dr. T. Y. Nelson delivered a lecture to the Western Medical Association at its annual meeting held at Wellington on September 23, 1951. The subject of the lecture was "Recent Advances in Pædiatric Surgery".

By-Laws.

At an extraordinary general meeting of the Association held on March 29, 1950, By-law 26, which governed the conditions under which medical services could be rendered to members of friendly society lodges on a contract basis, was deleted and a new by-law substituted in lieu thereof.

The new by-law defines the conditions under which members may render services to members of friendly society lodges on a concessional fee-for-service basis. It also provides that except with the consent of the Council, no agreement shall be entered into between a member and a friendly society lodge for the purpose of providing medical services to its members, payment for which is to be made on a capitation basis.

By-law 4 (Annual Subscription) was amended at extraordinary meetings held on October 25, 1951, and December 13, 1951.

A proposal submitted by Council to the extraordinary meeting held on October 25, 1951, that a new by-law (By-law 36), Ethical Rules for Industrial Medical Officers, be constituted was not approved.

The Federal Council of the British Medical Association in Australia.

Meetings.

The Federal Council of the British Medical Association in Australia met in Sydney on September 10, 11 and 12, 1951, and in Hobart on February 25, 26 and 27, 1952.

At these meetings the Branch was represented by Dr. A. J. Collins, Dr. H. R. R. Grieve, Dr. W. F. Simmons and Dr. A. J. Murray.

Australasian Medical Congress (British Medical Association).

Eighth Session.

The Eighth Session of the Australasian Medical Congress (British Medical Association) will be held at Melbourne, Victoria, on August 22-29, 1952, under the presidency of Sir John Newman-Morris.

On the nomination of the Council, Dr. George Bell has been appointed a vice-president of Congress and Dr. Selwyn G. Nelson, honorary local secretary.

The following members have been appointed presidents and vice-presidents of sections of Congress.

Presidents.—History of Medicine, Dr. A. S. Walker; Medicine, Dr. J. K. Maddox; Obstetrics and Gynæcology, Dr. C. L. Chapman; Ophthalmology, Dr. J. A. F. Flynn; Orthopædics and Physical Medicine, Dr. J. W. Hoets; Pathology, Bacteriology, Biochemistry, Experimental Medicine and Forensic Medicine, Dr. E. F. Thomson; Pædiatrics, Dr. Lindsay A. Dey; Radiology and Radiotherapy, Dr. H. R. Sear.

Vice-Presidents.—Anæsthesia, Dr. J. F. McCulloch; Dermatology, Dr. J. Witton Flynn; Naval, Military and Air Force Medicine and Surgery, Dr. R. H. Macdonald; Neurology and Psychiatry, Dr. D. W. H. Arnott; Oto-Rhino-Laryngology, Dr. B. B. Blomfield; Public Health, Industrial Medicine, Tropical Medicine and Aviation Medicine, Professor A. H. Baldwin; Surgery, Dr. V. M. Coppleson.

World Medical Association.

Dr. E. F. Thomson, a member of Council, and Dr. L. R. Mallen, a representative of the South Australian Branch on the Federal Council, were delegates of the Federal Council to the Fifth General Assembly, the World Medical Association, held at Stockholm in September, 1951.

National Health Service Pensioner Medical Service.

An extraordinary general meeting of the Association was held on June 5, 1951, to consider the Pensioner Medical Service of the Commonwealth Government; subsequent to this meeting, a special meeting of the delegates of Local Associations with Council was held on July 20, 1951, for the purpose of obtaining the views of members of the profession on this particular matter.

National Service Act, 1951.

The Council has pleasure in advising members that the Department of Labour and National Service has expressed its appreciation of the great service rendered by members in the carrying out of the medical examination of young men called up under the *National Service Act*, 1951.

The Council wishes to thank members for the response made by them to its appeal to help in this work of a national character.

Medical Services to Friendly Society Lodge Members.

The provision of medical services to members of friendly society lodges on a capitation basis ceased on March 31, 1951, excepting that in so far as subvention members who were not pensioners entitled to receive medical services through the government scheme were concerned, it was recommended to members that medical services be provided to them on a capitation basis to June 30, 1951.

No request was received from the friendly societies for the provision of medical services on a concessional basis.

The Committee for Placement of Resident Medical Officers.

The Committee for Placement of Resident Medical Officers was again called upon to exercise its function following the publication of the results of the Final Degree Examination in the Faculty of Medicine at the end of 1951. After the conjoint boards of the teaching hospitals had made their appointments, the committee allocated the remaining successful candidates to vacancies in the various hospitals. Altogether the committee made 199 allocations.

With the exception of one who had made arrangements for an appointment in America, all successful candidates received appointments. Two refused appointments, one having obtained an appointment in England.

The cooperation of the hospitals in responding to an appeal by the chairman of the Hospitals Commission of New South Wales to increase the number of their resident medical officers, was of great help to the committee in carrying out its work.

The Association was represented on the committee by Dr. A. M. McIntosh, the other representatives on the committee being Dr. A. B. Lilley, chairman of the Hospitals Commission of New South Wales, Dr. George Bell, representing the New South Wales Post-Graduate Committee in Medicine, and Professor Bruce T. Mayes, representing Professor H. R. Dew, Dean of the Faculty of Medicine.

The help of the secretariat of the British Medical Association, New South Wales Branch, was made available to the committee in its work.

Resident Medical Officers.

After consultation with representatives of resident medical officers, an agreement was reached by Council, with a committee representing the Hospitals Commission of New South Wales, the Hospitals Association of New South Wales, the Royal Newcastle Hospital, Royal Prince Alfred Hospital, Royal Alexandra Hospital for Children, Prince Henry Hospital, Sydney Hospital and the Royal North Shore Hospital, in regard to the salaries payable and the conditions of employment applicable to resident medical officers of the status of first and second year graduates.

The agreement provided for the payment of the following salaries from July 1, 1951, such salaries to be subject to variations in the basic wage:

First year graduates: £10 11s. 6d. per week (£550 *per annum*).

Second year graduates: £13 9s. 3d. per week (£700 *per annum*).

In addition, free board and lodging is provided in the case of the medical officer living in, and an additional payment based on the Hospital Nurses' (State) Award is allowed in the case of a medical officer living out. The agreement also provides for annual leave (first year graduates twenty-one days, second year graduates twenty-eight days), sick leave (twenty-eight days), the provision of uniforms free, or an allowance of 4s. per week in lieu thereof, and the provision of personal laundry.

Representation of the Medical Profession on Boards of Hospitals.

It has long been the policy of Council that the visiting honorary medical staffs should be represented on the boards of hospitals. The Hospitals Commission of New South Wales has maintained over the years, however, that, under the *Public Hospitals Act of New South Wales*, the two positions held concurrently are incompatible, having obtained legel opinion to this effect.

During the year Council took the matter up with the Minister for Health, New South Wales, and the Hospitals Commission of New South Wales, with a view to having the position rectified.

Both the Minister for Health and the Hospitals Commission indicated that the boards of hospitals would be requested to allow a representative of the honorary medical staffs to be present at their meetings, and the meetings of their house committees. No help, however, was otherwise forthcoming in regard to the direct representation of the visiting staffs on the boards.

With regard to the legal position in this matter, opinion was obtained some time ago by the Council, and it was to the effect that it was not incompatible for a member of the honorary medical staff of a public hospital to be also a member of the board. This opinion was forwarded to the Minister for Health.

Workers' Compensation Act, 1926-1951, Schedule of Fees.

Following negotiations by the Council with representatives of the Associated Licensed Insurers, the Government Insurance Office of New South Wales and the Non-Tariff Insurance Association of Australia, a new schedule of fees known as Schedule "G" came into operation on December 1, 1951.

British Medical Association Food Parcels Fund.

When the Council decided not to issue any further appeal to members to subscribe to the British Medical Association Food Parcels Fund, following the closing down of the Food for Britain Appeal, a balance of £55 17s. 6d. remained in the fund. This is being used in sending parcels to Westmoreland Lodge, a residential home for twelve of the lady beneficiaries of the Royal Medical Benevolent Fund.

Department of Medical Sociology and Research.

The work of the department in popular medical education has been conducted, as in previous years, chiefly through the medium of radio talks. Explanatory material has been supplied also to the Press and the Australian Broadcasting Commission to assist their presentation of news or articles on health and medical topics.

Talks given by the Spokesman have covered various aspects of health and nutrition (in the "Women's Magazine" programme), and others include an "Armchair Chat", Health Week talk, and contributions to the A.B.C. evening "News Review". In addition, talks have been continued in the session intended for listeners of the increasingly numerous age group of sixty-five and older (estimated to be now about 700,000 persons). To date, 100 of these talks have been given. In this series—the first of its kind in Australia—a wide range of subjects has been discussed, dealing with health and general welfare of the elderly and the aged.

British Medical Agency of New South Wales, Limited.

The annual general meeting of the British Medical Agency of New South Wales, Limited, was held on October 2, 1951. The report of the directors, which was presented by the chairman, Dr. George Bell, showed an improvement in the profit for the year ended June 30, 1951, on that of the previous year.

The directors are desirous that members of the profession should give continued support to their own agency.

NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

Balance Sheet as at December 31, 1951.

	£ s. d.	£ s. d.
FIXED LIABILITIES.		
Debentures:		
62—4% Series "A" at £10 each	620 0 0	
347—4·65% Series "B" at £50 each	17,350 0 0	
210—4·65% Series "C" at £10 each	2,100 0 0	
	20,070 0 0	
Less Amount Unpaid	54 0 0	
	20,016 0 0	
General Reserve Fund (used in the business)	1,250 0 0	
Australian Mutual Provident Society (secured by mortgage over property, British Medical Association House)	32,000 0 0	
		53,266 0 0
CURRENT LIABILITIES.		
Sundry Creditors	1,678 11 4	
Interest Accrued on Mortgage	113 6 8	
Deposit at Call	700 0 0	
Commercial Banking Company of Sydney, Limited—Premises and Branch Current Accounts	7,060 11 4	
		9,552 9 4
OTHER CREDIT BALANCES.		
Subscriptions Paid in Advance	49 17 6	
Provision for Taxation	450 0 0	
Provision for Painting Building	1,600 0 0	
Superannuation Fund Reserve (as *per contra*)	1,068 18 2	
		3,168 15 8
ACCUMULATED FUNDS.		
Balance as at December 31, 1950	98,838 18 6	
Less deficit for year ending December 31, 1951—		
Premises Account £4,094 13 6		
Surplus for year ended December 31, 1951—		
Branch Account £1,207 15 2		
	2,886 18 4	95,952 0 2
		£161,939 5 2

	£ s. d.	£ s. d.
FIXED ASSETS.		
Land and Buildings, British Medical Association House—at Cost *less* Depreciation on Building	138,848 11 3	
Library—at Valuation *less* Depreciation	4,836 3 7	
Office Furniture and Equipment—at Valuation *less* Depreciation	1,778 14 11	
Debentures — Australasian Medical Publishing Company, Limited	5,200 0 0	
Deposit on Debentures — Australasian Medical Publishing Company, Limited	121 8 10	
Commonwealth Treasury Bonds (Face Value)	7,000 0 0	
		157,784 18 7
FLOATING ASSETS.		
Sundry Debtors (after making provision for doubtful debts)—Sundry Tenants, Rents *et cetera*	2,152 11 6	
Cash on Hand	11 8 5	
		2,163 19 11
OTHER DEBIT BALANCES.		
Prepaid Insurances, Rates *et cetera*		921 8 6
Superannuation Fund Investments Account (as *per contra*)		1,068 18 2
		£161,939 5 2

Sydney, February 22, 1952.

K. C. T. RAWLE, President.
GEORGE BELL, Honorary Treasurer.
R. J. STIFFE, Financial Secretary.

We have examined the foregoing Balance Sheet with the Books of Account of the New South Wales Branch of the British Medical Association, and, having obtained all the information and explanations we have required, we are of the opinion that such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Company's affairs according to the best of our information and the explanations given to us and as shown by the Books of the Company. In our opinion the Register of Members and other records which the Company is required to keep by the New South Wales Companies Act, 1936, or by its Articles have been properly kept.

Sydney.

F. W. DUESBURY AND COMPANY,
Chartered Accountants (Aust.).

British Medical Association Lectures.

Dr. W. A. Hugh Smith delivered two lectures to the Eastern District Medical Association at its annual meeting held at Bellingen on April 28, 1951. The subjects of the lectures were "Backache" and "Disabilities of the Foot".

Dr. T. Y. Nelson delivered a lecture to the Western Medical Association at its annual meeting held at Wellington on September 23, 1951. The subject of the lecture was "Recent Advances in Pædiatric Surgery".

By-Laws.

At an extraordinary general meeting of the Association held on March 29, 1950, By-law 26, which governed the conditions under which medical services could be rendered to members of friendly society lodges on a contract basis, was deleted and a new by-law substituted in lieu thereof.

The new by-law defines the conditions under which members may render services to members of friendly society lodges on a concessional fee-for-service basis. It also provides that except with the consent of the Council, no agreement shall be entered into between a member and a friendly society lodge for the purpose of providing medical services to its members, payment for which is to be made on a capitation basis.

By-law 4 (Annual Subscription) was amended at extraordinary meetings held on October 25, 1951, and December 13, 1951.

A proposal submitted by Council to the extraordinary meeting held on October 25, 1951, that a new by-law (By-law 36), Ethical Rules for Industrial Medical Officers, be constituted was not approved.

The Federal Council of the British Medical Association in Australia.

Meetings.

The Federal Council of the British Medical Association in Australia met in Sydney on September 10, 11 and 12, 1951, and in Hobart on February 25, 26 and 27, 1952.

At these meetings the Branch was represented by Dr. A. J. Collins, Dr. H. R. R. Grieve, Dr. W. F. Simmons and Dr. A. J. Murray.

Australasian Medical Congress (British Medical Association).

Eighth Session.

The Eighth Session of the Australasian Medical Congress (British Medical Association) will be held at Melbourne, Victoria, on August 22-29, 1952, under the presidency of Sir John Newman-Morris.

On the nomination of the Council, Dr. George Bell has been appointed a vice-president of Congress and Dr. Selwyn G. Nelson, honorary local secretary.

The following members have been appointed presidents and vice-presidents of sections of Congress.

Presidents.—History of Medicine, Dr. A. S. Walker; Medicine, Dr. J. K. Maddox; Obstetrics and Gynæcology, Dr. C. L. Chapman; Ophthalmology, Dr. J. A. F. Flynn; Orthopædics and Physical Medicine, Dr. J. W. Hoets; Pathology, Bacteriology, Biochemistry, Experimental Medicine and Forensic Medicine, Dr. E. F. Thomson; Pædiatrics, Dr. Lindsay A. Dey; Radiology and Radiotherapy, Dr. H. R. Sear.

Vice-Presidents.—Anæsthesia, Dr. J. F. McCulloch; Dermatology, Dr. J. Witton Flynn; Naval, Military and Air Force Medicine and Surgery, Dr. R. H. Macdonald; Neurology and Psychiatry, Dr. D. W. H. Arnott; Oto-Rhino-Laryngology, Dr. B. B. Blomfield; Public Health, Industrial Medicine, Tropical Medicine and Aviation Medicine, Professor A. H. Baldwin; Surgery, Dr. V. M. Coppleson.

World Medical Association.

Dr. E. F. Thomson, a member of Council, and Dr. L. R. Mallen, a representative of the South Australian Branch on the Federal Council, were delegates of the Federal Council to the Fifth General Assembly, the World Medical Association, held at Stockholm in September, 1951.

National Health Service Pensioner Medical Service.

An extraordinary general meeting of the Association was held on June 5, 1951, to consider the Pensioner Medical Service of the Commonwealth Government; subsequent to this meeting, a special meeting of the delegates of Local Associations with Council was held on July 20, 1951, for the purpose of obtaining the views of members of the profession on this particular matter.

National Service Act, 1951.

The Council has pleasure in advising members that the Department of Labour and National Service has expressed its appreciation of the great service rendered by members in the carrying out of the medical examination of young men called up under the *National Service Act*, 1951.

The Council wishes to thank members for the response made by them to its appeal to help in this work of a national character.

Medical Services to Friendly Society Lodge Members.

The provision of medical services to members of friendly society lodges on a capitation basis ceased on March 31, 1951, excepting that in so far as subvention members who were not pensioners entitled to receive medical services through the government scheme were concerned, it was recommended to members that medical services be provided to them on a capitation basis to June 30, 1951.

No request was received from the friendly societies for the provision of medical services on a concessional basis.

The Committee for Placement of Resident Medical Officers.

The Committee for Placement of Resident Medical Officers was again called upon to exercise its function following the publication of the results of the Final Degree Examination in the Faculty of Medicine at the end of 1951. After the conjoint boards of the teaching hospitals had made their appointments, the committee allocated the remaining successful candidates to vacancies in the various hospitals. Altogether the committee made 199 allocations.

With the exception of one who had made arrangements for an appointment in America, all successful candidates received appointments. Two refused appointments, one having obtained an appointment in England.

The cooperation of the hospitals in responding to an appeal by the chairman of the Hospitals Commission of New South Wales to increase the number of their resident medical officers, was of great help to the committee in carrying out its work.

The Association was represented on the committee by Dr. A. M. McIntosh, the other representatives on the committee being Dr. A. B. Lilley, chairman of the Hospitals Commission of New South Wales, Dr. George Bell, representing the New South Wales Post-Graduate Committee in Medicine, and Professor Bruce T. Mayes, representing Professor H. R. Dew, Dean of the Faculty of Medicine.

The help of the secretariat of the British Medical Association, New South Wales Branch, was made available to the committee in its work.

Resident Medical Officers.

After consultation with representatives of resident medical officers, an agreement was reached by Council, with a committee representing the Hospitals Commission of New South Wales, the Hospitals Association of New South Wales, the Royal Newcastle Hospital, Royal Prince Alfred Hospital, Royal Alexandra Hospital for Children, Prince Henry Hospital, Sydney Hospital and the Royal North Shore Hospital, in regard to the salaries payable and the conditions of employment applicable to resident medical officers of the status of first and second year graduates.

The agreement provided for the payment of the following salaries from July 1, 1951, such salaries to be subject to variations in the basic wage:

First year graduates: £10 11s. 6d. per week (£550 *per annum*).

Second year graduates: £13 9s. 3d. per week (£700 *per annum*).

In addition, free board and lodging is provided in the case of the medical officer living in, and an additional payment based on the Hospital Nurses' (State) Award is allowed in the case of a medical officer living out. The agreement also provides for annual leave (first year graduates twenty-one days, second year graduates twenty-eight days), sick leave (twenty-eight days), the provision of uniforms free, or an allowance of 4s. per week in lieu thereof, and the provision of personal laundry.

Representation of the Medical Profession on Boards of Hospitals.

It has long been the policy of Council that the visiting honorary medical staffs should be represented on the boards of hospitals. The Hospitals Commission of New South Wales has maintained over the years, however, that, under the *Public Hospitals Act of New South Wales*, the two positions held concurrently are incompatible, having obtained legel opinion to this effect.

During the year Council took the matter up with the Minister for Health, New South Wales, and the Hospitals Commission of New South Wales, with a view to having the position rectified.

Both the Minister for Health and the Hospitals Commission indicated that the boards of hospitals would be requested to allow a representative of the honorary medical staffs to be present at their meetings, and the meetings of their house committees. No help, however, was otherwise forthcoming in regard to the direct representation of the visiting staffs on the boards.

With regard to the legal position in this matter, opinion was obtained some time ago by the Council, and it was to the effect that it was not incompatible for a member of the honorary medical staff of a public hospital to be also a member of the board. This opinion was forwarded to the Minister for Health.

Workers' Compensation Act, 1926-1951, Schedule of Fees.

Following negotiations by the Council with representatives of the Associated Licensed Insurers, the Government Insurance Office of New South Wales and the Non-Tariff Insurance Association of Australia, a new schedule of fees known as Schedule "G" came into operation on December 1, 1951.

British Medical Association Food Parcels Fund.

When the Council decided not to issue any further appeal to members to subscribe to the British Medical Association Food Parcels Fund, following the closing down of the Food for Britain Appeal, a balance of £55 17s. 6d. remained in the fund. This is being used in sending parcels to Westmoreland Lodge, a residential home for twelve of the lady beneficiaries of the Royal Medical Benevolent Fund.

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The annual general meeting of the British Medical Agency of New South Wales, Limited, was held on October 2, 1951. The report of the directors, which was presented by the chairman, Dr. George Bell, showed an improvement in the profit for the year ended June 30, 1951, on that of the previous year.

The directors are desirous that members of the profession should give continued support to their own agency.

NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

Balance Sheet as at December 31, 1951.

	£ s. d.	£ s. d.
FIXED LIABILITIES.		
Debentures:		
62—4% Series "A" at £10 each	620 0 0	
347—4·65% Series "B" at £50 each	17,350 0 0	
210—4·65% Series "C" at £10 each	2,100 0 0	
	20,070 0 0	
Less Amount Unpaid	54 0 0	
	20,016 0 0	
General Reserve Fund (used in the business)	1,250 0 0	
Australian Mutual Provident Society (secured by mortgage over property, British Medical Association House)	32,000 0 0	
		53,266 0 0
CURRENT LIABILITIES.		
Sundry Creditors	1,678 11 4	
Interest Accrued on Mortgage	113 6 8	
Deposit at Call	700 0 0	
Commercial Banking Company of Sydney, Limited—Premises and Branch Current Accounts	7,060 11 4	
		9,552 9 4
OTHER CREDIT BALANCES.		
Subscriptions Paid in Advance	49 17 6	
Provision for Taxation	450 0 0	
Provision for Painting Building	1,600 0 0	
Superannuation Fund Reserve (as *per contra*)	1,068 18 2	
		3,168 15 8
ACCUMULATED FUNDS.		
Balance as at December 31, 1950	98,838 18 6	
Less deficit for year ending December 31, 1951—		
Premises Account £4,094 13 6		
Surplus for year ended December 31, 1951—		
Branch Account £1,207 15 2		
	2,886 18 4	95,952 0 2
		£161,939 5 2

	£ s. d.	£ s. d.
FIXED ASSETS.		
Land and Buildings, British Medical Association House—at Cost *less* Depreciation on Building	138,848 11 3	
Library—at Valuation *less* Depreciation	4,836 3 7	
Office Furniture and Equipment—at Valuation *less* Depreciation	1,778 14 11	
Debentures — Australasian Medical Publishing Company, Limited	5,200 0 0	
Deposit on Debentures — Australasian Medical Publishing Company, Limited	121 8 10	
Commonwealth Treasury Bonds (Face Value)	7,000 0 0	
		157,784 18 7
FLOATING ASSETS.		
Sundry Debtors (after making provision for doubtful debts)—		
Sundry Tenants, Rents *et cetera*	2,152 11 6	
Cash on Hand	11 8 5	
		2,163 19 11
OTHER DEBIT BALANCES.		
Prepaid Insurances, Rates *et cetera*		921 8 6
Superannuation Fund Investments Account (as *per contra*)		1,068 18 2
		£161,939 5 2

Sydney, February 22, 1952.

K. C. T. RAWLE, President.
GEORGE BELL, Honorary Treasurer.
R. J. STIFFE, Financial Secretary.

We have examined the foregoing Balance Sheet with the Books of Account of the New South Wales Branch of the British Medical Association, and, having obtained all the information and explanations we have required, we are of the opinion that such Balance Sheet is properly drawn up so as to exhibit a true and correct view of the state of the Company's affairs according to the best of our information and the explanations given to us and as shown by the Books of the Company. In our opinion the Register of Members and other records which the Company is required to keep by the New South Wales Companies Act, 1936, or by its Articles have been properly kept.

Sydney.

F. W. DUESBURY AND COMPANY,
Chartered Accountants (Aust.).

NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

BRANCH ACCOUNT.

Income and Expenditure Account for the Year Ended December 31, 1951.

	£ s. d.	£ s. d.		£ s. d.	£ s. d.
To Salaries	6,942 7 8		By Subscription Revenue—		
„ Rent—Offices *et cetera*	1,000 0 0		1951	22,261 2 6	
„ Printing and Stationery	1,376 9 7		1950	234 10 6	
„ Stamps and Telegrams	769 19 3		Previous years	52 10 0	
„ Telephone	254 2 2				22,548 3 0
„ Code Address	2 4 6		*Less* Proportion due to—		
„ Travelling Expenses	268 4 1		British Medical Association	4,015 12 0	
„ Insurance	10 14 8		THE MEDICAL JOURNAL OF AUSTRALIA	2,308 11 6	
„ Exchange and Bank Charges	12 1 4				6,324 3 6
„ Refreshments—Meetings	39 15 0				16,223 19 6
„ Newspapers	11 19 8		„ Interest	380 4 10	
„ Sundry Petty Expenses	82 12 2		„ Rent—Assembly Hall	371 6 6	
„ Tea Money	131 10 10		„ Broadcasting Fees	238 7 0	
„ Federal Council	3,155 5 0		„ Sales C.F.A.	12 6	
„ Legal Expenses	10 1 0		„ Refund Expenses — Federal Council	96 13 9	
„ Repairs and Maintenance of Furniture and Equipment	37 9 0				1,087 4 7
„ Pay Roll Tax	162 14 1				
„ Medical Benefits Fund—Staff	14 13 0				
„ Incidental, Travelling and Entertaining Expenses	324 0 0				
„ Library Catalogues	465 0 0				
		15,071 3 0			
„ Depreciation—					
Library	435 6 2				
Office Furniture and Equipment	130 10 0				
		565 16 2			
„ Staff Superannuation Fund		466 9 9			
„ Balance, being Surplus for the year ended December 31, 1951, transferred to Accumulated Funds Account		1,207 15 2			
		£17,311 4 1			£17,311 4 1

Medical Finance, Limited.

The annual meeting of Medical Finance, Limited, was held on October 2, 1951.

The report of the directors for the year ended June 30, 1951, was presented by the chairman, Dr. George Bell. It showed that a small profit had been made for the year. The profit was small because the demand for the company's funds was limited, lower and more attractive interest rates being available elsewhere.

Premises Revenue Account.

The Premises Revenue Account discloses a net deficit of £4095 as against a net deficit of £132 for the year ended December 31, 1950, thus showing a decrease of £3963 in the net surplus revenue earned. This decrease is accounted for by a net increase in income of £3828 and a net increase in expenditure of £7791 as set out in detail on the accompanying comparative statements.

A comparison of percentages of expenditure to rent revenue with those at December 31, 1950, is as follows:

	1950.	1951.
Percentages of expenses to revenue	100·8%	118·4%
Percentages of surplus to revenue	—	—
	100·8%	118·4%

The percentage of rent revenue, expenses and depreciation and the percentage of net deficit for the year to the capital value of the land and buildings (British Medical Association House) as shown by the books at December 31, 1951, namely, £138,848, with the previous year's percentages in parentheses, are as follows:

Rent Revenue (including amount charged for British Medical Association Branch offices, *et cetera*)	15·9%	(12·9%)
Sundry Expenses, Interest and Provision for Painting of Building	16·8%	(11·1%)
Depreciation of Building	2·0%	
	18·8%	(1·9%)
Net deficit for year	2·9%	(·1%)

Financial Statement.

The Council presents to members the balance sheet and accounts in respect of the financial year which terminated on December 31, 1951.

Expenditure exceeds income by £2886 18s. 4d., a deficit due largely to expenses incurred in carrying out repairs to the roof and superstructure of British Medical Association House.

The sum of £3375 6s. 3d. has been written off for depreciation of the building (British Medical Association House), plant, office furniture and equipment, and the library.

The sum of £800 has been provided out of the current year's revenue to create a reserve for painting the exterior of the building. This amount for the time being is used in the business of the Association.

K. C. T. RAWLE,
President.

The balance sheet of the Branch and the income and expenditure account of the Branch and of the premises were received and adopted on the motion of Dr. George Bell, seconded by Dr. W. F. Simmons.

ELECTION OF OFFICE-BEARERS.

Dr. K. C. T. Rawle announced that the following had been elected members of the Council for the ensuing year.

Elected as Representing the General Body of Members.—Dr. M. F. Alexander, Dr. George Bell, Sir Charles Blackburn, Dr. J. E. F. Deakin, Dr. B. T. Edye, Dr. H. R. R. Grieve, Dr. G. C. Halliday, Dr. A. S. Johnson, Dr. A. W. Morrow, Dr. A. J. Murray, Dr. T. Y. Nelson, Dr. J. Rutherford, Dr. W. F. Simmons, Dr. F. B. M. Solling, Dr. A. C. Thomas, Dr. E. F. Thomson.

Elected as Representing Women Members.—Dr. Phyllis M. Anderson.

Elected as Representing the Public (Government) Medical Services.—Dr. H. H. Willis.

Elected as Representing Country Local Associations.—Dr. B. A. Cook, Dr. J. M. Dowling.

Elected as Representing Metropolitan Local Associations.—Dr. G. F. Elliott, Dr. G. L. Howe.

Messrs. F. W. Duesbury and Company were appointed auditors for the ensuing year.

ELECTION OF REPRESENTATIVE OF THE BRANCH AT THE ANNUAL REPRESENTATIVE MEETING OF THE BRITISH MEDICAL ASSOCIATION, 1952, DUBLIN.

On the motion of Dr. E. F. Thomson, seconded by Dr. H. H. Willis, Dr. A. M. McIntosh was appointed representative of the New South Wales Branch to attend the annual representative meeting of the British Medical Association, 1952, to be held in Dublin.

INCOMING PRESIDENT'S ADDRESS.

Dr. R. H. Macdonald delivered his incoming president's address (see page 689).

INDUCTION OF PRESIDENT.

Dr. K. C. T. Rawle inducted the President for the year 1952-1953, Dr. R. H. Macdonald. Dr. Macdonald thanked the members for his election.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

AN APPOINTMENT AT ILLAWARRA.[1]

Colonial Secretary's Office,
Sydney, 27 Sept., 1834.

John Osborne, Esq.,
Surgeon, R.N.

Sir,

Having laid before the Governor your letter of the 22nd Instant tendering your services as Surgeon at Illawarra, I am directed by His Excellency to offer you the situation on the following terms—that you receive £50 a year from Government, for which you will be expected to visit, prescribe for, and give medicine to Convicts in Government employ without further remuneration and to perform the like service to all the convicts in private service in the District at the rate of five shillings a year for each. You will also have to visit the Government Establishments once a week, and Settlers Farms once a fortnight, and to answer any calls which may be made for your assistance in the intervals of periodical visits.

If the settlers should subscribe for the erection of a Hospital in a convenient situation for the mass of the Inhabitants of the District an aid of fifty pounds will be given by Govt on the building being approved.

I have, &c.,
ALEXR. MCLEAY.

Correspondence.

SUBACUTE BACTERIAL ENDOCARDITIS CAUSED BY ERYSIPELOTHRIX RHUSIOPATHIÆ

SIR: Dr. W. E. David's letter published on April 12, 1952, discussing the paper by Lawes *et alii* on "Subacute Bacterial Endocarditis Caused by Erysipelothrix Rhusiopathiæ" contained several statements which, without going into the merits of the case reported, cannot be allowed to pass unchallenged.

Dr. David doubts the diagnosis of bacterial endocarditis because, amongst others: (*a*) the patient did not look sick; (*b*) he had no clubbing; (*c*) the response to penicillin was too prompt; (*d*) the course of the disease appeared to him acute rather than subacute. Modern cardiologists will most certainly disagree with his criticism on all four points. To be sure, no heart disease has changed in character and prognosis quite as much during the last decade as bacterial endocarditis; whereas previously a fatal outcome was the rule in any patient suffering from the disease, one can now, since the introduction of specific antibiotic therapy, confidently expect recovery in two out of every three patients, provided the disease is not complicated by cardiac failure.

Obviously the clinical account given by Sir Thomas Lewis described a case dying of bacterial endocarditis rather than the early manifestation which we must endeavour to recognize. The great majority of patients now treated do not conform to the classical description and fail to show one or more of the so-called cardinal signs.

It is no exaggeration to say that the patient with bacterial endocarditis that "looks extremely ill, anxious, and pallid" is one in whom there has been undue delay in recognizing the disease. Furthermore, if cardiologists waited for the appearance of clubbing before making the diagnosis of bacterial endocarditis and instituting appropriate treatment, they could hardly be proud of the striking reduction in mortality figures in this condition. Nobody hesitates in making a diagnosis of lobar pneumonia because *herpes labialis* is not present.

I can assure Dr. David that all of us who have seen cases of bacterial endocarditis treated successfully with antibiotics would not be astonished if the temperature returned to normal within forty-eight hours. Indeed, if no improvement is discernible after such an interval many authorities would regard this as sufficient cause for reviewing the adequacy of the treatment given. Finally, since the introduction of specific antibiotic therapy the distinction between acute and subacute bacterial endocarditis has lost most of its original significance. Nothing is gained by arguing whether a particular case belongs to one group or the other.

While paying full respect to his epoch-making contribution, it is our duty to be familiar with the great advances in cardiology which have taken place in the seven years which have elapsed since Sir Thomas Lewis's death.

Yours, etc.,

231 Macquarie Street,
Sydney,
April 16, 1952.

G. E. BAUER.

SIR: In reply to Dr. W. E. David, I wish to state that I agree that the diagnostic criteria which he mentioned have been accepted as prominent features of subacute bacterial endocarditis before the advent of the antibiotics. Now we do not wait until they are evident before making a diagnosis and applying treatment; otherwise valuable time is lost.

An unexplained fever of seven or more days' duration in the presence of an organic heart murmur is sufficient to warrent a diagnosis of subacute bacterial endocarditis.

The diagnosis of patent interventricular septum was made on the thrill and loud harsh murmur maximal at the left sternal border opposite the third and fourth ribs.

A patient with this abnormality does not usually look ill; in fact he may lead an active life without symptoms.

Yours, etc.,

"Craignish",
185 Macquarie Street,
Sydney.
April 22, 1952.

F. A. E. LAWES.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Numbers 29 and 31, of April 17 and 24, 1952.

NAVAL FORCES OF THE COMMONWEALTH.

Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

His Excellency the Governor-General in Council has approved that Surgeon Captain Denis Adrian Pritchard, C.B.E., B.Sc., M.B., Ch.M., D.T.M. (Sydney), M.R.C.P. (London), F.R.A.C.P., Q.H.P., be promoted to the rank of Surgeon Rear-Admiral, dated 20th March, 1952.—(Ex. Min. No. 27—Approved 10th April, 1952.)

Loan to Royal Navy for Service and Training.—The following is loaned to the Royal Navy for Service and Training: Surgeon Lieutenant John Roger McNeill, dated 16th January, 1952.

Resignation.—The resignation of Sean Desmond Brennan of his appointment as Surgeon Lieutenant (for short service) is accepted, dated 3rd March, 1952.

Citizen Naval Forces of the Commonwealth.

Royal Australian Naval Volunteer Reserve.

Appointment.—Sydney Lance Townsend is appointed Surgeon Commander, dated 12th February, 1952.

[1] From the original in the Mitchell Library, Sydney.

AUSTRALIAN MILITARY FORCES.

Royal Australian Army Medical Corps.

NX208060 Captain E. M. Slattery is retired, 11th March, 1947 (in lieu of the notification respecting this officer which appeared in Executive Minute No. 123 of 1947, promulgated in *Commonwealth Gazette* No. 167 of 1947).

SX700032 Captain (Temporary Major) D. D. Beard relinquishes the temporary rank of Major and is transferred to the Citizen Military Forces, 4th January, 1952.

To be Captain, 22nd February, 1952.—NX700351 Hugh Cairns Anderson.

To be Captains (provisionally).—VX700243 Willoughby Sidney Sewell, 20th December, 1951, VX700245 Peter Ernest Silberstein, 27th December, 1951, and VX700257 Alexander Norman Jones, 22nd January, 1952.

Citizen Military Forces.

Southern Command: Third Military District.

Royal Australian Army Medical Corps (Medical).—3/101815 Captain G. W. Cooper is appointed from the Reserve of Officers, 4th September, 1951.

Central Command: Fourth Military District.

Royal Australian Army Medical Corps (Medical).—4/32004 Captain D. D. Beard is transferred from the Interim Army with regimental seniority next after 4/31963 Captain V. D. Plueckhahn, 4th January, 1952.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps.

1st Military District: To be Honorary Captains, 28th February, 1952.—Neville Edward Parker, Peter Reginald Robertson, William Keith Ross Mackenzie, John Douglas Newman Yelland, David Colin Webster, David Bruce Nimmo, Frederick Cook Ruffle, Clifford Francis Greenslade, Daniel Egbert Kleinig, Ross Gregory Monahan and Roland Fortescue Ash.

2nd Military District.—Captain H. W. Austin is granted the honorary rank of Major, 28th February, 1952.

Retired List.

3rd Military District.—Colonel Sir C. S. Hicks is appointed Scientific Food Consultant, Quartermaster-General's Branch, Army Headquarters, and is granted the honorary rank of Brigadier whilst holding the appointment, 10th March, 1952. —(Ex. Min. No. 51—Approved 17th April, 1952.)

ROYAL AUSTRALIAN AIR FORCE.

Permanent Air Force: Medical Branch.

Air Commodore E. A. Daley, C.B.E., M.B., B.S., D.T.M., F.R.A.C.P., is promoted to the rank of Air Vice-Marshal, 20th March, 1952.

The following are appointed to short-service commissions, on probation for a period of twelve months, with the rank of Flight Lieutenant: Jack Robert Harrison (013663), 8th February, 1952, Frederick John Gardiner Arnold (025085), 12th February, 1952, Murray Arthur May (013705), 20th February, 1952.

The resignation of Flying Officer C. R. Thomas (024424) is accepted, 29th February, 1952.

The date included in the notification regarding Flight Lieutenant B. N. Turner (023026), as approved in Executive Council Minute No. 8 of 1952, appearing in *Gazette* No. 18, dated 21st February, 1952, is amended to read 19th February, 1952.

Squadron Leader M. C. Clarke (011321) is granted the acting rank of Wing Commander, 17th March, 1952.

Flight Lieutenant J. L. Struan-Marshall (035910) is granted the acting rank of Squadron Leader, 7th April, 1952.

The following are appointed to short-service commissions, on probation for a period of twelve months, with the rank of Flight Lieutenant: Graeme George Wagner (013706), 20th February, 1952; Neville Leslie Groves (025211), 10th March, 1952.

Citizen Air Force: Medical Branch.

Flight Lieutenant (Temporary Squadron Leader) (Honorary Wing Commander) N. M. Kater, M.C. (021960) ceases to hold the honorary rank of Wing Commander and is transferred to the Reserve, 4th March, 1952.

Reserve: Medical Branch.

The following former officers are appointed to commissions with rank as indicated: (Flight Lieutenant (Temporary Wing Commander)) O. W. Leitch (281889), 4th February, 1952. (Flight Lieutenant) C. R. Laing (253407), 8th January, 1952, W. J. Betts (287464), 30th January, 1952.

Jack Robert Harrison (277593) is appointed to a commission, 21st January, 1952, with the rank of Flight Lieutenant.

The appointment of Flight Lieutenant E. M. Slattery (267795) is terminated, 30th November, 1945.

Edward Matthew Slattery (267795) is appointed to a commission, 12th March, 1947, with the rank of Flight Lieutenant.

Obituary.

FRANCIS JOHN NIALL.

WE are indebted to Dr. Kevin P. Rush for the following appreciation of the late Dr. Francis John Niall.

Dr. Frank Niall, honorary indoor physician at Saint Vincent's Hospital, Melbourne, died on March 22, 1952.

In 1912, a very junior boy, I entered school. My first class was with big "Bill" Murray, second form Latin. My apprehension was not allayed by the tradition that reputed "Bill" to have cuffed a boy so hard that he was projected from the second division lobby to the foot of the stairs in the hall without contacting an intervening step; however, the kindly interest of Frank Niall, a few years my senior (and what a difference a few years make in the junior school), smoothed the way. Perhaps his position as the eldest of five brothers was already moulding a character endowed by nature with a fine foundation. Looking back, I realize that those traits which characterized the man were already manifest, a purposefulness beyond his years, a kindly disposition, a sense of justice so unusual in a schoolboy, a lively interest in his fellows and an intellect beyond the average.

Leaving "Xavier" in 1916 relatively young, Niall passed on to the university. He was among the "tops" in the State at the Leaving Honour Public Examinations then in vogue, and by virtue of honours in physics and chemistry he entered immediately into second year; this privilege was extended by the university to such students for a year or two at that period. He passed through his medical course always occupying a "handy" position in the class lists, pursuing his clinical studies at the Melbourne Hospital, where a close relative, Dr. J. Nihill, was on the nose and throat staff, and finishing with a term as resident medical officer at that hospital. Almost immediately afterwards he settled in practice at Sandringham, later moving to Hampton. It was inevitable that he would succeed, and in a few years he built a large, honourable and well-remembered practice in that area.

In 1926 Niall married Mary Constance Gorman, daughter of the late Mr. Richard Francis Gorman and Mrs. Agnes Gorman, of Galtee Park, Berrigan; two of his wife's brothers are members of the profession, Dr. J. S. Gorman, of Bendigo, and Dr. A. P. Gorman, of Deniliquin. Always scholastically minded, Niall pursued his studies while in practice and took his doctorate of medicine (Melbourne) in 1927; proceeding to England in 1928, he became a Member of the Royal College of Physicians (London) in 1929. Returning to Melbourne, he commenced consultant medical practice in the city in 1929. He was, I think, the first boy from "Xavier" to set up as a consulting physician in Melbourne, a proud position, for that school has given Melbourne and Australia many fine medical men before and since. He was a foundation Fellow of The Royal Australasian College of Physicians and an examiner. He was appointed out-patient physician at Saint Vincent's Hospital in 1928, and in 1930 indoor physician at Prince Henry's Hospital. In 1935 he became acting indoor physician at Saint Vincent's Hospital and a year later received his full appointment. He resigned from the indoor staff of Prince Henry's Hospital in 1935 and was appointed consultant, which status he retained till the time of his death. He was also consultant physician to the Victorian Eye and Ear Hospital.

Niall was a first-class physician, with a particular flair for and interest in cardiac disease, a sound teacher and a wise administrator. He was one of the university lecturers in medicine and an examiner for the doctorate of medicine and for the final examinations. Dean of the clinical school in 1944, his loss will be sadly felt there and indeed in the larger medical world of Melbourne and Victoria.

For many years until quite recently, I with others enjoyed the weekly Saturday afternoon tennis outings at his home in Studley Park Road, Kew, the stimulating conversation

as much as the tennis. When he played he gave the matter his undivided attention just as he did in all things. He was an unfailing host, a good friend, a true physician, loving his family and his fellows in the real sense of that word. His son, John, second of six children, is a resident medical officer at Saint Vincent's Hospital. What more could a man contribute against the debit of the inherent frailties of human nature? May his soul rest in peace.

JOHN JAMES O'KEEFE.

WE are indebted to Dr. W. J. Binns for the following appreciation of the late Dr. John James O'Keefe.

John James O'Keefe came down from Brisbane to do medicine at the University of Sydney with a great reputation in mathematics, music and chess. He went into residence at Saint John's College and entered enthusiastically into the life of the College. He passed his first year amongst the top candidates, his second year amongst the upper middle, his third year amongst the lower middle, his fourth year near the tail, and had to repeat his fifth year. He used to refer to this downfall as "the best thing that ever happened to me".

Failing to secure a hospital residency, he came out to Kogarah as assistant to his uncle, the late Dr. D'Arcy Bucknell. After some two years, Dr. Bucknell decided to go to London to do a post-graduate course in surgery, leaving O'Keefe in charge. Twelve months later Bucknell returned, but died of malignant disease of the spleen. O'Keefe took over the practice.

When I first joined Dr. O'Keefe in December, 1909, he had become legendary in several respects, in particular his devotion to chess, his dress and his address. During the first six months of our cohabitation the evening routine consisted of his setting out from memory the problem he was adjudging and deciding which was the best solution. He was then judging a problem solving competition for *Tit Bits* of London. At 10.30 p.m. the housekeeper brought in a couple of glasses of milk; we said "Goodnight" and went off to bed. O'Keefe went out very seldom, to a theatre or a concert, and then only in company with Dr. James McLeod, of Hurstville. He smoked "Three Castles" cigarettes incessantly until, for no apparent reason, he decided to give them up. I could always predict such abstinences, for he would place a dozen boxes of 50's on the mantelpiece and not smoke one for a fortnight or longer, until the fit was off him. Hurstville "Mac" used to refer to these fits as "the hunger strikes of an addict" and as "conscience endurance tests". His dress also was legendary—a clawhammer coat and a black bowler hat, in addition, if it may be regarded as an article of attire, a well-waxed flaxen moustache, that badge of professional adolescence. He had two Talbot cars, a 12 horsepower and a 15 horsepower, an unheard-of extravagance when most were content with a one horsepower conveyance or, if better endowed, a single cylinder De Dion Bouton. The constant use of a car soon altered the rig of the day to a sac suit and felt hat; it also obliterated the Kaiser Wilhelm moustache.

It fell out on this wise. Just as we sat down to lunch, with an urgent appendix to be done at 3 p.m. at the Saint George Hospital, a ring came in for Cronulla. O'Keefe told the housekeeper: "Don't bother to keep my lunch warm. I'll buy a couple of pounds of grapes and eat them on my way back." The day was windy and every time he tried to put a grape into his mouth his moustache beat him to it. He reached the theatre esurient but punctual with the purple-stained remnants of his moustache affronting his face. "I'll shave the damned thing off", he announced before retiring. Next day consternation spread throughout St. George and I had my busiest morning in years. The waiting-room was crowded, but holding its breath, like a classroom of schoolboys awaiting the execution of a truant. The tip-toe traffic came all to my door without a single jam or argument until a dental student friend of O'Keefe's came in and handed me the following doggerel:

The absence of O'Keefe's moustache
Around his oral borders
Makes me opine the worthy Doc.
Hath taken Holy Orders.

"Read it to the multitude", quoth I, "it will set their minds at rest and their tongues in motion." The ruse worked like a charm in the evening when I had little to do but note that the majority of patients carried a handkerchief in their hands, to stifle an irritating cough. His address also was legendary, supposed to be brusque and abrupt. Certainly

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED APRIL 26, 1952.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	..	..	..	..	..	..	..	..	..
Amœbiasis	..	..	..	..	..	..	..	..	..
Ancylostomiasis	..	..	..	..	..	..	..	..	..
Anthrax	..	..	..	..	..	..	..	..	..
Bilharziasis	..	..	..	..	..	..	..	..	..
Brucellosis	..	..	..	..	..	..	..	..	..
Cholera	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus)	..	..	..	..	..	..	..	..	..
Dengue	..	..	..	..	..	..	..	..	..
Diarrhœa (Infantile)	..	..	11(6)	..	..	..	2	..	13
Diphtheria	9(8)	4(2)	5(4)	..	4(4)	..	..	..	22
Dysentery (Bacillary)	..	1(1)	10(9)	..	2(2)	..	..	1	14
Encephalitis	..	..	..	..	..	..	..	..	..
Filariasis	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid	..	..	..	..	..	..	..	..	..
Infective Hepatitis	..	..	..	..	9(4)	..	..	..	9
Lead Poisoning	..	..	..	..	..	..	..	..	..
Leprosy	..	..	..	..	..	..	3	..	3
Leptospirosis	..	..	2	..	..	..	..	..	2
Malaria	..	..	..	..	..	..	..	..	..
Meningococcal Infection	1(1)	1	..	..	..	..	..	..	2
Ophthalmia	..	..	..	..	..	..	..	..	..
Ornithosis	..	..	..	..	..	..	..	..	..
Paratyphoid	..	..	..	..	..	..	..	..	..
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	10(4)	1(1)	2(1)	10(7)	2(1)	..	1	..	26
Puerperal Fever	..	..	1	..	..	..	..	..	1
Rubella	..	5(5)	..	..	..	..	..	..	5
Salmonella Infection	..	2	..	..	..	..	..	1	3
Scarlet Fever	14(6)	51(27)	..	5(3)	3(3)	..	..	..	73
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	..	..	..	..	..	..	..	..	..
Trachoma	..	..	..	..	..	..	..	..	..
Trichinosis	..	..	..	..	..	..	..	..	..
Tuberculosis	26(19)	13(9)	8(4)	10(7)	8(7)	2(1)	1	..	68
Typhoid Fever	..	2	..	..	..	..	..	..	2
Typhus (Flea-, Mite- and Tick-borne)	..	..	..	..	1(1)	..	..	..	1
Typhus (Louse-borne)	..	..	..	..	..	..	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] Figures in parentheses are those for the metropolitan area.

he did not suffer fools gladly or receive hypochondriacs graciously. Towards unmarried ladies his approach was severely circumspect, but that did not stifle rumours of his being on his honeymoon whenever he took a few days off at Katoomba or Medlow. When he did take unto himself a wife, the rumour propagandists were sceptical; they had so many memories of unfulfilled prophecies to forget. He used also to affirm that he would never go into Macquarie Street, but he was not married then. He learned later *l'homme propose mais la femme dispose.*

Our partnership ended in mutual good wishes in 1913. A contributing factor to the dissolution was the disagreement with the Illawarra Friendly Society Association. How we faced and coped with the troubles are matters of (unwritten) history. Throughout the disagreement we held two strong points—first and chiefly, O'Keefe's readiness to help all or any of us, and second, the Saint George Hospital (alias the Kogarah Cottage Hospital). We were all on the staff and the Board made membership of the British Medical Association a *sine qua non* for admission to the staff. Certainly O'Keefe did 50% of the work and 90% of the surgery, but the rest of us formed a happy family. I can vouch for the correctness of the latter figure, for was I not the only anæsthetist? O'Keefe detested anæsthetics, having once had a chloroform fatality. On one occasion he generously offered to give an anæsthetic for me to remove an appendix. The appendix proved to be retrocaecal and the anæsthesia very uneven. In the midst of my worries, I heard a voice from heaven saying: "Oh, Binns, I'm afraid I'm adding to your difficulties. Do you mind if we change places?" The patient made an uninterrupted recovery. For one who began behind scratch in surgery he attained a greater degree of proficiency than many with two years' hospital training: in medicine he was painstaking, careful and a mine of clinical observation; in obstetrics (his *bête noire*) he possessed a vast experience and an aseptic conscience. He was in fact the greatest general practitioner I have ever met in forty years of practice. He had an incisive analytical mind, a prodigious memory, and he loved his work.

JAMES JAMIESON BLACK.

We regret to announce the death of Dr. James Jamieson Black, which occurred on May 2, 1952, at Toorak, Victoria.

HERBERT SPENCE.

We regret to announce the death of Dr. Herbert Spence, which occurred on May 2, 1952, at Brighton, Victoria.

ALEXANDER WALTERS.

We regret to announce the death of Dr. Alexander Walters, which occurred on May 8, 1952, at Swanbourne, Western Australia.

EDWARD FRANCIS McCARTHY.

We regret to announce the death of Dr. Edward Francis McCarthy, which occurred on May 11, 1952, at Concord, New South Wales.

Notice.

THE ROYAL NORTH SHORE HOSPITAL OF SYDNEY.

A MEETING of the Unit of Clinical Investigation of the Royal North Shore Hospital of Sydney will be held on Thursday, June 5, 1952, at 5 p.m. A short communication will be given by Dr. Clair Isbister on "Acute Mastitis", followed by a discussion. The meeting is open to the medical profession generally, and all those interested are welcome to attend.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Gray, Kenneth Roy, M.B., B.S., 1950 (Univ. Sydney), Mater Misericordiæ Hospital, Crow's Nest.

Hagan, Brian Elwin, M.B., B.S., 1951 (Univ. Sydney), 291 Concord Road, Concord West.

Diary for the Month.

MAY 27.—New South Wales Branch, B.M.A.: Ethics Committee.
MAY 28.—Victorian Branch, B.M.A.: Council Meeting.
MAY 29.—New South Wales Branch, B.M.A.: Branch Meeting.
JUNE 3.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JUNE 4.—Western Australian Branch, B.M.A.: Council Meeting.
JUNE 4.—Victorian Branch, B.M.A.: Clinical Meeting.
JUNE 5.—South Australian Branch, B.M.A.: Council Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federal Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178 North Terrace, Adelaide): All Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

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